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# Lepidopterous Insects Composition in Jindo Island, Korea in Summer

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## ABSTRACT

We surveyed the biodiversity of lepidopterous insects in Jindo Island using UV bucket trap in July 2016 to determine the relationship between surrounding environment and ecosystem in order to contribute to biodiversity conservation and management of coastal islands in Korea. Based on our survey results, a total of 262 lepidopterous insect species in 16 families were collected from Jindo Island. Members belonging to families Noctuidae and Geometridae made up approximately half of the total species (86 species [32.82%] in Noctuidae and 44 species [16.79] in Geometridae). There were 29 species (11.07%) belonging to Crambidae and 28 species (10.69%) belonging to Pyralidae. As a result of all collections based on previous literature and this study, a total of 730 species belonging to 34 families were collected from Jindo Island, including 33 protected species, 242 species (33.15%) belonging to Noctuidae (the most abundant), 124 species (16.99%) belonging to Geometridae, 79 species (10.82%) belonging to Crambidae, and 65 species (8.90%) belonging to Pyralidae. The most frequently collected species was *Lamoria glaucalis* in this syudy. Our results on the diversity of lepidopterous insects will provide basic information for future investigation on diverse changes in the ecosystem of Jindo Island, Korea.

**Keywords:** lepidopterous insect, diversity, Jindo Island, bucket trap, Korea

## INTRODUCTION

Jindo Island is the third largest island and located in province of Jeollanam-do in South Korea. The island is the principle island among the cluster of 230 islets in the south western part of the Korean peninsula. The island has many park reserves like the Dadohae National Marine Park, historical relics and sites. According to the weather data from Haenam meteorological station closest to the investigation, the average temperature for the year is 14.4°C, and the mean annual precipitation is 1,360.2 mm (average last 30 years, National Weather Service) (Korea Meteorological Administration, 2013).

National Institute of Enviromental Research (2012a, 2012b, 2012c, 2012d, 2012e, 2012f) studies on the insect fauna on Jindo Island reported 671 species belonging to 108 families of 12 Orders and identified 412 species of 28 families in lepidopterous insects. Also Sohn et al. (2005) are reported a total of 573 lepidopterous species belonging to 37 families. The objective of the present study was to clarify insect fauna from Jindo Island. The results of this study might offer distinctive information for biodiversity conservation and management of coastal islands in Korea. We focused on lepidopterous insect fauna to provide basic information for future research studies to investigate the causes of diverse changes in the ecosystem of Jindo Island.

## MATERIALS AND METHODS

Since insects have diversified habitats and behavioral habits, we used as many different collection methods as possible according to the characteristics of adults of each taxonomic group. This research targeted samples caught by installing UV bucket trap. To collect lepidopterous insects in the entire Jindo Island, one circular 12 W UV bucket trap powered by

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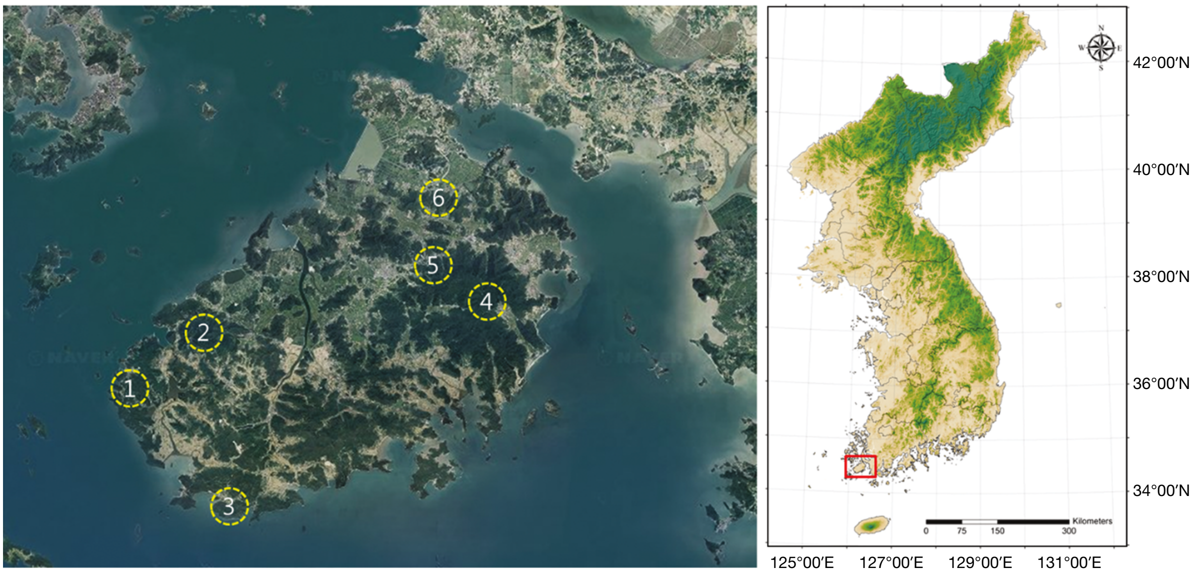
12 V battery (Bioquip, Rancho Dominguez, CA, USA) was installed in a spot. UV bucket traps were installed at 6 sites (Fig. 1) where insects could be collected automatically. Collecting activities were focused on lepidopterous insects that occupied the largest taxa among insects of the forest ecosystem. Lepidopterous insects caught in the trap were collected the next day. They were killed by ethyl-acetate and KCN.

Insect specimens were classified at family level. They were identified based on the description in the 'Checklist of Korean Insects (Paek et al., 2010).'



| | Site | Habitat types | Date | GPS coordination |
|---|---|---|---|---|
| 1 | Geubchisan | Small hilly area, coniferous forest (pine tree) | 6–7 Jul 2016 | 34°24′48.80″N, 126°06′14.58″E |
| 2 | Jiryeoksan | Mixed forest | 6–7 Jul 2016 | 34°26′23.81″N, 126°08′51.67″E |
| 3 | Cheondungsan | Small hilly area, coniferous forest (pine tree) | 7–8 Jul 2016 | 34°21′37.76″N, 126°10′30.93″E |
| 4 | Cheomchalsan-1 | Coniferous forest (pine tree) | 7–8 Jul 2016 | 34°27′41.63″N, 126°19′28.18″E |
| 5 | Cheomchalsan-2 | Mixed forest | 8–9 Jul 2016 | 34°28′40.31″N, 126°19′52.83″E |
| 6 | Godusan | Small hilly area, coniferous forest (pine tree) | 8–9 Jul 2016 | 34°31′25.54″N, 126°17′31.49″E |

**Fig. 1.** Study areas and dates of field survey in Jindo Island.

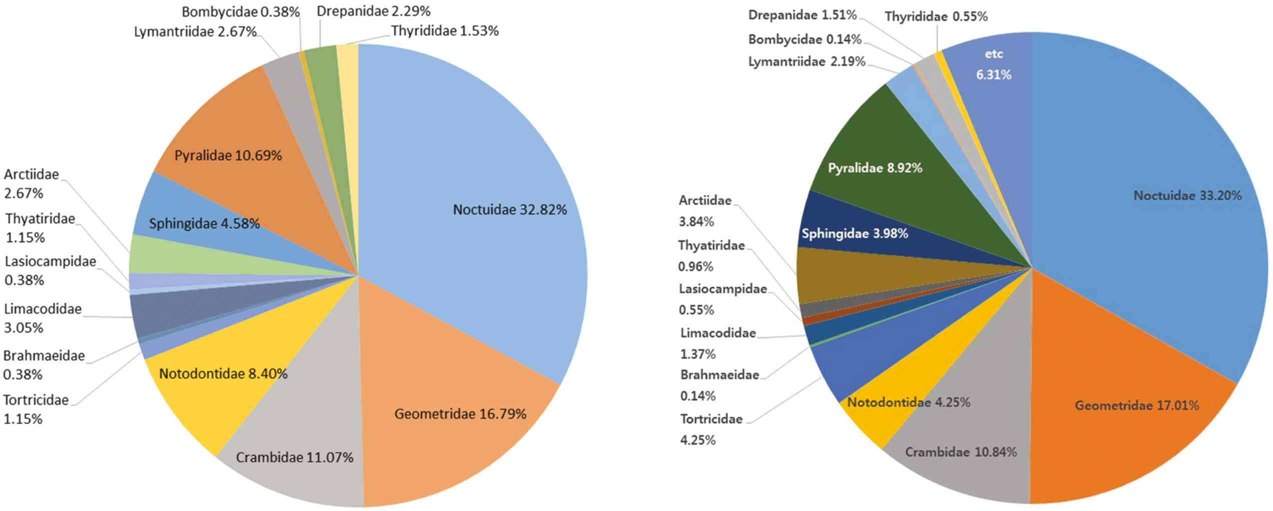


**Fig. 2.** Taxonomic group composition of the lepidopterous insect on Jindo (left, surveys; right, all the collections).

## RESULTS AND DISCUSSION

### Taxonomic composition

From the surveys, a total of 262 insect species belonging to 16 families were collected from Jindo Island. Members of Noctuidae and Geometridae made up approximately half of the total species. There were 86 species (32.82%) belonging to Noctuidae and 44 species (16.79) belonging to Geometridae. There were 29 species (11.07%) beloinging to Crambidae and 28 species (10.69%) belonging to Pyralidae. As a result of all collections based on literature and this study, 730 species beloinging to 34 families were identified for Jindo Island, including 33 protected species. There are 242 species (33.15%) belonging to Noctuidae, which is the most abundant in the collections. There are 124 species (16.99%) belonging to Geometridae, 79 species (10.82%) belonging to Crambidae, and 65 species (8.90%) belonging to Pyralidae (Table 1, Fig. 2, Appendix 1).

In the 6 study sites of this study, Jiryeoksan (S2) showed the highest species diversity with 268 individuals (141 species), followed by Geubchisan (S1) with 236 individuals (99 species), Godusan (S6) with 155 individuals (89 species), Cheondungsan (S3) with 155 individuals (79 species), Cheomchalsan-2 (S5) with 119 individuals (69 species), and Cheomchalsan-1 (S4) with 118 individuals (69 species). For individuals collected, there were 766 individuals belonging to Noctuidae, the largest family in Jindo Island, followed by 452 individuals belonging to Pyralidae, 439 individuals belonging to Crambidae, 370 individuals belonging to Geometridae, and 185 individuals belonging to Notodontidae (Appendix 1).

The most frequently collected species was *Lamoria glau-*

**Table 1.** The total number of lepidopterous insect species and individuals in the results of previous literatures and the present study in Jindo Island

| Family | 2016 | | 2012 | | 2005 | | Total | | Relative dominance (%) |
|---|---|---|---|---|---|---|---|---|---|
| | No. of species | No. of individuals | No. of species | No. of individuals | No. of species | No. of individuals | No. of species | No. of individuals | |
| Noctuidae | 86 | 248 | 134 | 281 | 166 | 237 | 242 | 766 | 33.15 |
| Geometridae | 44 | 131 | 68 | 142 | 85 | 166 | 124 | 439 | 16.99 |
| Crambidae | 29 | 169 | 50 | 110 | 46 | 91 | 79 | 370 | 10.82 |
| Notodontidae | 22 | 82 | 18 | 42 | 24 | 61 | 31 | 185 | 4.25 |
| Tortricidae | 3 | 3 | 8 | 18 | 25 | 59 | 31 | 80 | 4.25 |
| Oecophoridae | – | – | 4 | 7 | 4 | 153 | 6 | 161 | 0.82 |
| Brahmaeidae | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 0.14 |
| Ctenuchidae | – | – | 1 | 2 | 1 | 1 | 1 | 3 | 0.14 |
| Zygaenidae | – | – | 3 | 5 | 2 | 11 | 3 | 16 | 0.41 |
| Limacodidae | 8 | 12 | 6 | 25 | 9 | 30 | 10 | 67 | 1.37 |
| Epiplemidae | – | – | 2 | 3 | 2 | 2 | 2 | 5 | 0.27 |
| Lasiocampidae | 1 | 4 | 3 | 5 | 2 | 2 | 4 | 11 | 0.55 |
| Saturniidae | – | – | 3 | 4 | 2 | 2 | 4 | 6 | 0.55 |
| Lecithoceridae | – | – | 1 | 1 | 1 | 5 | 2 | 6 | 0.27 |
| Gelechiidae | – | – | 1 | 1 | 11 | 34 | 12 | 35 | 1.64 |
| Thyatiridae | 3 | 14 | 7 | 12 | 5 | 6 | 7 | 32 | 0.96 |
| Arctiidae | 7 | 13 | 14 | 21 | 25 | 31 | 28 | 65 | 7.12 |
| Sphingidae | 12 | 36 | 21 | 50 | 25 | 36 | 29 | 122 | 3.97 |
| Pyralidae | 28 | 204 | 43 | 86 | 40 | 162 | 65 | 452 | 8.90 |
| Lymantriidae | 7 | 41 | 11 | 26 | 11 | 28 | 16 | 95 | 2.19 |
| Bombycidae | 1 | 2 | – | – | 1 | 2 | 1 | 4 | 0.14 |
| Cossidae | – | – | 1 | 5 | 1 | 2 | 1 | 7 | 0.14 |
| Drepanidae | 6 | 44 | 5 | 14 | 9 | 14 | 11 | 72 | 1.51 |
| Gracillariidae | – | – | 1 | 1 | 1 | 1 | 1 | 1 | 0.14 |
| Psychidae | – | – | 2 | 4 | – | – | 2 | 4 | 0.27 |
| Yponomeutidae | – | – | 1 | 1 | 1 | 43 | 3 | 45 | 0.41 |
| Nolidae | – | – | – | – | 1 | 1 | 1 | 1 | 0.14 |
| Cochylidae | – | – | – | – | 2 | 2 | 2 | 2 | 0.27 |
| Stathmopodidae | – | – | – | – | 1 | 1 | 1 | 1 | 0.14 |
| Tineidae | – | – | – | – | 1 | 1 | 1 | 1 | 0.14 |
| Blastobasidae | – | – | – | – | 2 | 4 | 2 | 4 | 0.27 |
| Sessidae | – | – | – | – | 1 | 1 | 1 | 1 | 0.14 |
| Epicopeiidae | – | – | – | – | 1 | 1 | 1 | 1 | 0.14 |
| Thyrididae | 4 | 7 | 3 | 5 | 3 | 6 | 4 | 18 | 0.55 |
| Total | 262 | 1,051 | 412 | 872 | 512 | 1,197 | 730 | 3,080 | |

**Table 2.** List of notable and legally protected lepidopterous insects from Jindo Island

| Classfication | | Species |
|---|---|---|
| Endangered species | Level I | – |
| | Level II | – |
| Management of expotable species | | *Actias artemis*, *Actias gnoma*, *Ambulyx japonica koreana*, *Antheraea yamamai*, *Comibaena tenuisaria*, *Dichomeris lespedezae*, *Dichomeris strictella*, *Endotricha parki*, *Goniorhynchus exemplaris*, *Hedya auricristana*, *Hyposemansis albipuncta*, *Lymantria dispar*, *Metaeuchrominus flavofascialis*, *Moma tsushimana*, *Oruza kunsuki*, *Ourapteryx persica*, *Problepsis diazoma*, *Promalactis odaiensis*, *Pyrausta mutuurai*, *Rhodoneura shini*, *Samia Cynthia*, *Sinomphisa plagialis*, *Teliphisa albifusa* |
| Endemic species | | *Dichomeris lespedezae*, *Dichomeris strictella*, *Metaeuchrominus flavofascialis*, *Oruza kunsuki*, *Promalactis odaiensis*, *Rhodoneura shini*, *Teleiodes yanyangensis*, *Tornodoxa longiella* |
| Korean red list | | – |
| IUCN red list | | – |
| Climate-sensitive indicator species | | *Macrauzata maxima*, *Marumba spectabilis* |

IUCN, International Union for Conservation of Nature.

*calis* in all collections. It was also the most dominant species collected in this study. Other frequently caught species were species beloinging to Noctuidae (including *Hydrillodes funeralis* and *Hydrillodes pacificus*), Crambidae (including *Bradina geminalis*, *Pleuroptya chlorophanta*, *Herpetogramma luctuosalis*, and *Tyspanodes hypsalis*), and Pyralidae (such as *Herculia pelasgalis*) (Appendix 1).

### Protected species

There were no endangered species or government protected species found in any of these samples. However, there were four Endemic species and one climate-sensitive indicator species (Table 2).

We enumerated the 730 insected species distributed in Jindo Island based on the present study and previous literatures. Further detailed studies including seasonal surveys using other methods are needed to investigate insects in this area for the purpose of biodiversity conservation and management of coastal islands in Korea.

## ACKNOWLEDGMENTS

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**Appendix 1.** Taxonomic list of the lepidopterous insects in Jindo Island

| Scientific name | | | | 2016 | | | | | | 2012$^{a,b,c,d,e,f}$ | 2005$^{g}$ |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Families | | Species | | S1 | S2 | S3 | S4 | S5 | S6 | | |
| Gracillariidae | 가는나방과 | *Caloptilia sapporella* | 졸참나무가는나방 | – | – | – | – | – | – | 1 | 6 |
| Cochylidae | 가는잎말이나방과 | *Cochylidia contumescens* | 큰횡줄가는잎말이나방 | – | – | – | – | – | – | – | 1 |
| | | *Eupoecilia ambiguella* | 버찌가는잎말이나방 | – | – | – | – | – | – | – | 1 |
| Drepanidae | 갈고리나방과 | *Agnidra scabiosa* | 참나무갈고리나방 | 3 | 2 | 4 | – | – | 2 | 5 | 1 |
| | | *Callidrepana patrana* | 금빛갈고리나방 | – | – | – | – | – | – | – | 2 |
| | | *Deroca inconclusa* | 남방흰갈고리나방 | – | – | – | – | – | – | – | 1 |
| | | *Drepana curvatula* | 밤색갈고리나방 | – | 2 | – | – | 2 | 2 | 2 | – |
| | | *Macrauzata maxima* | 유리창갈고리나방 | – | – | – | – | – | – | – | 1 |
| | | *Macrocilix mysticata* | 민갈고리나방 | – | – | – | 1 | – | – | – | 1 |
| | | *Nordstr omia grisearia* | 횡줄갈고리나방 | – | – | – | – | – | – | 2 | – |
| | | *Nordstr omia japonica* | 황줄점갈고리나방 | 3 | 2 | 4 | 3 | 2 | 1 | 2 | 4 |
| | | *Oreta pulchripes* | 노랑갈고리나방 | 4 | – | – | 2 | 2 | 2 | 3 | 1 |
| | | *Pseudalbara parvula* | 세줄꼬마갈고리나방 | – | 1 | – | – | – | – | – | 1 |
| | | *Tridrepana crocea* | 남방노랑갈고리나방 | – | – | – | – | – | – | – | 1 |
| Stathmopodidae | 감꼭지나방과 | *Stathmopoda auriferella* | 열매꼭지나방 | – | – | – | – | – | – | – | 1 |
| Tineidae | 곡식좀나방과 | *Morophaga bucephala* | 큰점무늬좀나방 | – | – | – | – | – | – | – | 1 |
| Cossidae | 굴벌레나방과 | *Zeuzera multistrigata* | 알락굴벌레나방 | – | – | – | – | – | – | 5 | 2 |
| Bombycidae | 누에나방과 | *Bombyx mandarina* | 멧누에나방 | – | 2 | – | – | – | – | – | 2 |
| Lymantriidae | 독나방과 | *Arctornis album* | 상제독나방 | – | – | – | – | – | – | – | 4 |
| | | *Arctornis kumatai* | 점흰독나방 | 4 | 2 | – | – | 2 | 2 | 5 | 1 |
| | | *Calliteara argentata* | 삼나무독나방 | – | – | – | – | – | – | 1 | – |
| | | *Calliteara conjuncta* | 사발무늬독나방 | – | – | – | – | – | – | – | 1 |
| | | *Calliteara pseudabietis* | 사과독나방 | – | – | – | – | – | – | – | 1 |
| | | *Cifuna locuples* | 콩독나방 | 2 | 2 | 2 | 2 | 2 | – | 2 | 14 |
| | | *Euproctis piperita* | 무늬독나방 | – | 3 | – | – | – | – | 2 | 1 |
| | | *Euproctis pseudoconspersa* | 차독나방 | – | – | – | – | – | – | 3 | – |
| | | *Euproctis pulverea* | 꼬마독나방 | – | 2 | – | – | – | 2 | 4 | 2 |
| | | *Euproctis similis* | 흰독나방 | – | – | – | – | – | – | 1 | 1 |
| | | *Euproctis subflava* | 독나방 | 3 | 2 | 1 | 2 | – | – | 2 | 1 |
| | | *Euproctis torasan* | 뒷검은독나방 | – | – | – | – | – | – | – | 1 |
| | | *Lymantria dispar* | 매미나방 | – | – | – | – | – | – | 4 | 1 |
| | | *Lymantria monacha* | 얼룩매미나방 | – | – | 1 | – | – | – | – | – |
| | | *Neocifuna eurydice* | 포도독나방 | – | – | 2 | 1 | 3 | – | 1 | – |
| | | *Pida niphonis* | 검정무늬독나방 | – | – | – | – | – | – | – | 1 |
| Pyralidae | 명나방과 | *Acrobasis hollandella* | 배잎말이알락명나방 | – | – | – | – | – | – | – | 2 |
| | | *Acrobasis injunctella* | | – | – | – | – | – | – | – | 1 |
| | | *Acrobasis pseudodichromella* | 반원알락명나방 | – | – | – | – | – | – | – | 1 |
| | | *Aphomia zelleri* | 큰부채명나방 | 1 | – | – | – | – | – | – | 1 |
| | | *Arippara indicator* | 굵은띠비단명나방 | – | – | – | 1 | – | – | 5 | 5 |
| | | *Assara funerella* | 삼각무늬알락명나방 | – | – | – | – | – | – | 1 | – |
| | | *Bostra nanalis* | 보라비단명나방 | – | 1 | – | – | – | – | – | – |
| | | *Calguia defiguralis* | 통마디알락명나방 | – | – | – | – | – | – | 2 | 1 |
| | | *Cnaphalocrocis medinalis* | 혹명나방 | – | – | – | – | – | – | 5 | 1 |

**Appendix 1.** Continued

| Scientific name | | | | 2016 | | | | | | 2012[a,b,c,d,e,f] | 2005[g] |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Families | | Species | | S1 | S2 | S3 | S4 | S5 | S6 | | |
| Pyralidae | 명나방과 | *Conobathra bellulella* | 배무늬알락명나방 | – | – | – | – | – | – | 1 | 1 |
| | | *Conobathra obrutella* | 흰띠알락명나방 | – | – | – | – | – | – | – | 1 |
| | | *Datanoides fasciata* | 왕빗수염줄명나방 | – | – | – | – | – | – | 1 | – |
| | | *Dioryctria abietella* | 솔알락명나방 | – | – | – | – | – | – | 1 | – |
| | | *Dioryctria sylvestrella* | 큰솔알락명나방 | – | – | – | – | – | – | – | 1 |
| | | *Endotricha consocia* | 큰홍색뾰족명나방 | – | – | – | – | – | – | 3 | 1 |
| | | *Endotricha kuznetzovi* | 흰띠뾰족명나방 | – | – | – | – | – | – | 1 | – |
| | | *Endotricha minialis* | 날개뾰족명나방 | – | – | – | – | – | – | 1 | – |
| | | *Endotricha olivacealis* | 검은점뾰족명나방 | – | – | – | – | – | – | 2 | 1 |
| | | *Endotricha parki* | 갈고리뾰족명나방 | – | – | – | – | – | – | 1 | – |
| | | *Epilepia dentata* | 두줄집명나방 | – | – | – | – | – | – | 1 | 3 |
| | | *Etielloides bipartitellus* | 흰수염알락명나방 | – | – | – | – | – | – | 1 | – |
| | | *Etielloides sejunctellus* | 흰띠회색알락명나방 | – | – | – | – | – | – | 2 | – |
| | | *Eulophopalpia pauperalis* | 날개검은부채명나방 | – | – | – | – | 1 | – | – | – |
| | | *Herculia pelasgalis* | 쥐빛비단명나방 | 6 | 5 | – | – | – | 5 | 5 | 1 |
| | | *Lamoria glaucalis* | 앞붉은부채명나방 | 19 | 24 | 16 | – | – | 15 | 5 | – |
| | | *Lepidogma melanobasis* | 네점집명나방 | – | 2 | – | 2 | 2 | – | – | – |
| | | *Lista ficki* | 줄보라집명나방 | – | 3 | – | – | – | – | – | 3 |
| | | *Locastra muscosalis* | 벼슬집명나방 | 3 | 2 | 2 | – | – | 2 | 5 | 3 |
| | | *Maruca testulalis* | 콩명나방 | – | – | – | – | – | – | 1 | 1 |
| | | *Nephopterix bicolorella* | 줄노랑알락명나방 | 1 | – | – | – | – | – | – | – |
| | | *Nephopterix tomisawai* | 작은남방알락명나방 | – | – | – | – | – | – | 2 | – |
| | | *Nyctegretis triangulella* | 세모알락명나방 | – | – | – | – | – | – | 1 | – |
| | | *Oncocera semirubella* | 앞붉은명나방 | 3 | | 2 | | 2 | 2 | 4 | 4 |
| | | *Orthaga achatina* | 갈색집명나방 | – | 2 | – | – | – | – | 1 | 1 |
| | | *Orthaga euadrusalis* | 날개끝검은집명나방 | – | – | – | – | – | – | 2 | 1 |
| | | *Orthaga olivacea* | 제주집명나방 | – | 2 | 2 | 2 | 2 | 2 | 1 | 1 |
| | | *Orthaga onerata* | 밑검은집명나방 | – | – | – | – | – | – | 3 | 1 |
| | | *Orthopygia glaucinalis* | 곧은띠비단명나방 | 4 | 3 | – | – | – | – | 1 | 1 |
| | | *Orthopygia nannodes* | 갈색띠비단명나방 | – | – | – | – | – | – | – | 1 |
| | | *Orthopygia placens* | 뒷검은비단명나방 | 4 | 2 | – | – | 2 | 1 | 2 | 1 |
| | | *Orybina regalis* | 노랑눈비단명나방 | – | 3 | – | 3 | 3 | 3 | 3 | 1 |
| | | *Phycitodes subcretacellus* | 앞흰줄알락명나방 | – | – | – | – | – | – | – | 3 |
| | | *Protoetiella bipunctella* | 두점알락명나방 | – | – | – | – | – | – | 1 | – |
| | | *Pseudacrobasis nankingella* | 앞흰알락명나방 | – | – | – | – | – | – | 1 | – |
| | | *Pseudocadra cuprotaeniella* | 검은자주빛알락명나방 | – | – | – | – | – | – | – | 2 |
| | | *Pyralis farinalis* | 밀가루줄명나방 | – | – | – | – | – | – | – | 1 |
| | | *Pyralis regalis* | 은무늬줄명나방 | 4 | 2 | – | – | – | – | – | 3 |
| | | *Sacada approximans* | 빗수염줄명나방 | – | – | – | – | – | – | 1 | 1 |
| | | *Salma amica* | 흰무늬집명나방 | – | 2 | – | – | – | – | 1 | 1 |
| | | *Sandrabatis crassiella* | 긴수염알락명나방 | – | – | – | – | – | – | – | 43 |
| | | *Spatulipalpia albistrialis* | 굵은수염알락들명나방 | – | – | – | – | – | – | – | 1 |
| | | *Stemmatophora albifimbrialis* | 두줄명나방 | – | 1 | – | 1 | – | – | – | 1 |

**Appendix 1.** Continued

| Scientific name | | | | 2016 | | | | | | 2012[a,b,c,d,e,f] | 2005[g] |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Families | | Species | | S1 | S2 | S3 | S4 | S5 | S6 | | |
| Pyralidae | 명나방과 | *Stemmatophora valida* | 검은날개비단명나방 | 2 | 1 | – | 1 | – | – | 1 | 31 |
| | | *Stericta kogii* | 타이형집명나방 | 3 | – | – | – | – | – | 2 | 1 |
| | | *Tamraca torridalis* | 쌍줄비단명나방 | 1 | 3 | 2 | 2 | 2 | 1 | 5 | 1 |
| | | *Tegulifera bicoloralis* | 쌍띠비단명나방 | – | – | 2 | 2 | – | 1 | 2 | – |
| | | *Teliphasa elegans* | 푸른빛집명나방 | 1 | – | 1 | – | – | – | 2 | 1 |
| | | *Teliphisa albifusa* | 흰날개큰집명나방 | – | – | – | – | – | – | 1 | – |
| | | *Termioptycha inimica* | 검스레집명나방 | – | – | 1 | – | – | – | 1 | – |
| | | *Termioptycha margarita* | 흰날개집명나방 | 2 | – | – | – | – | – | 1 | 2 |
| | | *Termioptycha nigrescens* | 흰무늬집명나방붙이 | – | – | 1 | – | – | 1 | – | – |
| | | *Trachycera paradichromella* | | – | – | – | – | – | – | – | 30 |
| | | *Trebania flavifrontalis* | 붉은머리비단명나방 | – | – | – | – | 1 | 1 | – | 2 |
| | | *Trichotophysa jucundalis* | 녹색집명나방 | – | – | – | – | – | – | – | 1 |
| Blastobasidae | 밑두리뿔나방과 | *Neoblastobasis decolor* | 남방밑두리뿔나방 | – | – | – | – | – | – | – | 2 |
| | | *Neoblastobasis spiniharpella* | 네점밑두리뿔나방 | – | – | – | – | – | – | – | 2 |
| Sphingidae | 박각시과 | *Acosmeryx castanea* | 산포도박각시 | – | – | – | – | – | – | – | 1 |
| | | *Acosmeryx naga* | 포도박각시 | – | – | – | 2 | – | 1 | 4 | 1 |
| | | *Agrius convolvuli* | 박각시 | – | – | – | – | – | – | 1 | 1 |
| | | *Ambulyx japonica koreana* | 갈고리박각시 | – | – | – | – | – | – | 2 | 2 |
| | | *Ambulyx ochracea* | 점갈고리박각시 | – | – | – | – | – | – | 1 | 2 |
| | | *Ambulyx schauffelbergeri* | 노랑갈고리박각시 | – | – | – | – | – | – | – | 4 |
| | | *Ampelophaga rubiginosa* | 머루박각시 | – | 1 | – | – | – | 1 | 5 | 1 |
| | | *Aspledon himachala* | 애벌꼬리박각시 | – | – | – | – | – | – | 1 | 1 |
| | | *Callambulyx tatarinovi* | 녹색박각시 | – | 2 | – | 1 | – | 1 | 3 | 1 |
| | | *Cephonodes hylas* | 줄녹색박각시 | – | – | – | – | – | – | – | 1 |
| | | *Clanis bilineata* | 콩박각시 | – | – | – | – | – | – | 2 | 1 |
| | | *Clanis undulosa* | 무늬콩박각시 | – | – | – | – | – | – | – | 1 |
| | | *Deilephila elpenor* | 주홍박각시 | – | – | – | – | – | – | 2 | 1 |
| | | *Dolbina exacta* | 애물결박각시 | 3 | – | – | – | – | 3 | 2 | 1 |
| | | *Dolbina tancrei* | 물결박각시 | – | 1 | – | – | – | – | 3 | 3 |
| | | *Hemaris affinis* | 검정황나꼬리박각시 | – | – | – | – | – | – | – | 1 |
| | | *Macroglossum pyrrhosticta* | 벌꼬리박각시 | – | – | – | – | – | – | 2 | 1 |
| | | *Macroglossum stellaparum* | 꼬리박각시 | – | – | – | – | – | – | – | 1 |
| | | *Marumba gaschkewitschi* | 분홍등줄박각시 | – | – | – | – | 1 | – | 1 | 0 |
| | | *Marumba jankowskii* | 작은등줄박각시 | – | – | – | 1 | – | – | – | – |
| | | *Marumba spectabilis* | 제주등줄박각시 | – | – | – | 1 | – | – | 2 | 1 |
| | | *Marumba sperchius* | 등줄박각시 | 2 | 1 | – | – | – | 1 | 2 | 1 |
| | | *Parum colligata* | 닥나무박각시 | – | – | – | – | – | – | 2 | 1 |
| | | *Phillosphingia dissimilis* | 벚나무박각시 | 1 | 2 | – | 2 | – | 1 | 3 | – |
| | | *Psilogramma increta* | 큰쥐박각시 | – | – | – | – | – | – | 1 | 1 |
| | | *Rhagastis mongoliana* | 우단박각시 | 1 | 2 | – | – | 1 | 2 | 4 | 3 |
| | | *Smerinthus planus* | 뱀눈박각시 | – | – | – | – | – | – | – | 1 |
| | | *Theretra clotho* | 큰줄박각시 | – | – | – | – | – | 1 | 3 | – |
| | | *Theretra japonica* | 줄박각시 | – | – | – | – | – | – | 4 | 3 |

**Appendix 1.** Continued

| Scientific name | | | | 2016 | | | | | | 2012[a,b,c,d,e,f] | 2005[g] |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Families | | Species | | S1 | S2 | S3 | S4 | S5 | S6 | | |
| Noctuidae | 밤나방과 | *Acontia bicolora* | 노랑무늬꼬마밤나방 | – | – | – | – | – | – | 2 | 1 |
| | | *Acrapex azumai* | 애밤나방 | – | – | – | – | – | – | – | 2 |
| | | *Acronicta (Plataplecta) pulverosa* | 흰배저녁나방 | – | – | – | – | – | – | – | 1 |
| | | *Acronicta hercules* | 점줄저녁나방 | – | – | – | – | – | – | 1 | – |
| | | *Acronicta major* | 왕뿔무늬저녁나방 | – | – | – | – | – | – | – | 1 |
| | | *Acronicta rumicis* | 배저녁나방 | – | – | – | – | – | – | 5 | 1 |
| | | *Adrapsa simplex* | 별박이수염나방 | – | – | – | – | – | – | – | 1 |
| | | *Adris tyrannus* | 으름밤나방 | – | – | – | – | – | – | 1 | 1 |
| | | *Agrotis ipsilon* | 검거세미밤나방 | 2 | – | – | – | – | – | 3 | 1 |
| | | *Amphipyra acheron* | 뒷검은까마귀밤나방 | – | 1 | – | – | – | – | – | – |
| | | *Amphipyra livida* | 까마귀밤나방 | 5 | 2 | 2 | – | – | – | 4 | 1 |
| | | *Amphipyra monolitha* | 흰눈까마귀밤나방 | – | – | – | – | – | – | 1 | 1 |
| | | *Amphipyra pyramidea* | 피라밑까마귀밤나방 | – | – | – | – | – | – | – | 1 |
| | | *Anachrostis nigripunctalis* | 흰무늬짤름나방 | – | – | – | – | – | – | – | 8 |
| | | *Anapamea incerta* | 꼬마주황얼룩밤나방 | – | – | – | – | – | – | – | 3 |
| | | *Anomis commoda* | 큰붉은잎밤나방 | – | – | – | – | – | – | 1 | 1 |
| | | *Anomis flava* | 목화잎밤나방 | – | – | – | – | – | – | – | 1 |
| | | *Anomis mesogona* | 무궁화잎밤나방 | – | – | – | – | – | – | – | 1 |
| | | *Anuga multiplicans* | 긴수염비행기밤나방 | – | 2 | – | – | – | – | 1 | 2 |
| | | *Arcte coerulea* | 암청색줄무늬밤나방 | – | – | – | – | – | – | – | 1 |
| | | *Artena dotata* | 푸른띠밤나방 | 1 | – | – | – | – | – | 2 | – |
| | | *Athetis albisignata* | 흰점국화밤나방 | – | – | – | – | – | – | 2 | 1 |
| | | *Athetis cinerascens* | 흑점밤나방 | – | – | – | – | – | – | – | 1 |
| | | *Athetis dissimilis* | 뒷흰날개담색밤나방 | 1 | – | – | – | – | – | – | 1 |
| | | *Athetis gluteosu* | 각시띠담색밤나방 | – | – | – | – | – | – | – | 1 |
| | | *Athetis stellata* | 국화밤나방 | – | – | – | – | – | – | 1 | 1 |
| | | *Athetis striolata* | 줄담색밤나방 | – | – | – | – | – | – | – | 1 |
| | | *Atrachea nitens* | 소루쟁이밤나방 | – | – | – | – | – | – | 1 | 1 |
| | | *Aventiola pusilla* | 꽃무늬꼬마밤나방 | – | – | – | – | – | – | – | 2 |
| | | *Axylia putris* | 썩은밤나방 | 1 | 1 | – | – | – | – | 4 | 4 |
| | | *Blasticorhinus ussuriensis* | 우수리밤나방 | 2 | 2 | 2 | – | 1 | 1 | 4 | 1 |
| | | *Blenina senex* | 나무껍질밤나방 | – | – | – | – | – | – | – | 1 |
| | | *Bomolocha melanica* | 먹구름수염나방 | – | – | – | – | – | – | 1 | – |
| | | *Bomolocha stygiana* | 고개무늬수염나방 | – | 1 | – | – | – | – | – | – |
| | | *Brevipecten consanguis* | 남방쌍무늬짤름나방 | – | 1 | – | – | – | 1 | 2 | 2 |
| | | *Bryophila granitalis* | 이끼밤나방 | – | – | – | – | – | – | 1 | 1 |
| | | *Bryophilina mollicula* | 연푸른꼬마밤나방 | – | 1 | – | – | 1 | 1 | – | – |
| | | *Callopistria albolineola* | 흰줄어린밤나방 | – | – | – | – | – | – | 4 | 1 |
| | | *Callopistria duplicans* | 제주어린밤나방 | – | – | – | – | – | – | 3 | 1 |
| | | *Callopistria juventina* | 어린밤나방 | – | – | – | – | – | 1 | 3 | 1 |
| | | *Callopistria repleta* | 얼룩어린밤나방 | – | – | – | – | – | – | 1 | 1 |
| | | *Calyptra gruesa* | 큰갈고리밤나방 | – | 2 | – | 1 | 1 | – | 6 | 1 |
| | | *Calyptra hokkaida* | 북방갈고리밤나방 | – | – | – | – | – | – | – | 1 |

**Appendix 1.** Continued

| Scientific name | | | | 2016 | | | | | | 2012$^{a,b,c,d,e,f}$ | 2005$^{g}$ |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Families | | Species | | S1 | S2 | S3 | S4 | S5 | S6 | | |
| Noctuidae | 밤나방과 | *Calyptra thalictri* | 갈고리밤나방 | – | – | – | – | – | – | – | 1 |
| | | *Catocala dissimilis* | 끝흰무늬박이뒷날개나방 | – | – | – | – | – | – | 2 | – |
| | | *Catocala doerriesi* | 굵은줄노랑뒷날개나방 | 1 | – | – | 1 | – | – | 2 | – |
| | | *Catocala dula* | 붉은뒷날개나방 | – | – | – | 1 | – | – | 1 | – |
| | | *Catocala fulminea* | 광대노랑뒷날개나방 | – | – | – | – | – | – | 1 | – |
| | | *Catocala jonasii* | 뾰죽노랑뒷날개나방 | – | 1 | – | – | – | – | – | – |
| | | *Catocala praegnax* | 들노랑뒷날개나방 | – | 1 | – | – | – | – | – | 1 |
| | | *Chibidokuga hypenodes* | 꼬마검정짤름나방 | – | – | – | – | – | – | – | 1 |
| | | *Chrysodeixis eriosoma* | 붉은금무늬밤나방 | 1 | – | – | – | – | – | – | – |
| | | *Chrysorithrum amatum* | 사랑밤나방 | 1 | – | – | – | – | – | 2 | 1 |
| | | *Cidariplura gladiata* | 흰점멧수염나방 | – | – | – | – | – | – | – | 1 |
| | | *Coenobia orientalis* | 점줄물가밤나방 | – | – | – | – | – | – | – | 4 |
| | | *Colocasia mus* | 털보버짐나방 | – | – | – | – | – | – | – | 1 |
| | | *Condica illecta* | 희미무늬밤나방 | – | – | – | – | – | – | 1 | – |
| | | *Conistra grisescens* | 점줄무늬밤나방 | – | – | – | – | – | – | – | 1 |
| | | *Corgatha dictaria* | 흰줄꼬마밤나방 | – | – | – | – | – | – | – | 1 |
| | | *Corgatha nitens* | 붉은꼬마밤나방 | 1 | – | – | – | – | – | 1 | 3 |
| | | *Corgatha pygmaea* | 검은줄꼬마밤나방 | – | – | – | 1 | – | – | – | – |
| | | *Corsa petrina* | 잔줄밤나방 | – | – | – | – | – | – | 2 | 1 |
| | | *Cosmia achatina* | 제주꼬마밤나방 | – | 1 | – | 1 | – | 1 | – | 6 |
| | | *Cosmia affinis* | 느릅밤나방 | – | 1 | – | – | – | – | 1 | – |
| | | *Cosmia camptostigma* | 회색쌍줄밤나방 | 1 | – | – | – | – | – | – | – |
| | | *Craniophora fasciata* | 굵은무늬저녁나방 | – | – | – | – | – | – | – | 1 |
| | | *Craniophora jankowskii* | 지옥저녁나방 | – | – | – | – | – | – | – | 1 |
| | | *Craniophora odade* | 얼룩저녁나방 | – | 1 | – | – | – | – | – | – |
| | | *Cryphia obscura* | 띠이끼밤나방 | – | – | – | – | – | – | 1 | 1 |
| | | *Ctenoplusia* (*Acanthoplusia*) *agnata* | 콩은무늬밤나방 | – | – | – | – | – | – | 6 | 1 |
| | | *Ctenoplusia albostriata* | 긴금무늬밤나방 | – | – | – | – | – | – | 1 | 1 |
| | | *Cymatophoropsis unca* | 남방세무늬저녁나방 | – | – | – | – | – | – | – | 1 |
| | | *Daddala lucilla* | 톱날무늬잎밤나방 | – | – | – | – | – | – | – | 2 |
| | | *Diarsia canescens* | 물결밤나방 | – | – | – | – | – | – | – | 1 |
| | | *Dinumma deponens* | 검은띠밤나방 | 3 | – | – | 1 | – | – | – | 1 |
| | | *Diomea cremata* | 보라잎밤나방 | – | – | – | – | – | – | 1 | – |
| | | *Diomea discisigna* | 네눈검정잎밤나방 | – | – | 2 | – | – | – | – | – |
| | | *Diphtherocone alpium* | 높은산저녁나방 | – | 1 | – | | – | – | 2 | 3 |
| | | *Dysgonia arctotaenia* | 흰띠수중다리밤나방 | – | – | – | – | – | – | 2 | – |
| | | *Dysgonia arcuata* | 물결수중다리밤나방 | – | – | – | – | – | – | – | 1 |
| | | *Dysgonia mandschuriana* | 북방수중다리밤나방 | – | – | – | – | – | – | – | 1 |
| | | *Dysgonia maturata* | 보라끝수중다리밤나방 | – | – | – | – | – | – | – | 1 |
| | | *Dysmilichia gemella* | 점띠애기밤나방 | – | – | – | – | – | – | 2 | – |
| | | *Earias pudicana* | 붉은가밤나방 | 2 | 2 | – | – | – | – | 3 | – |
| | | *Earias roseifera* | 분홍무늬푸른밤나방 | – | – | – | – | – | – | 1 | – |
| | | *Ectogonia butleri* | 볼록짤름나방 | – | – | – | – | – | – | – | 1 |

**Appendix 1.** Continued

| Scientific name | | | | 2016 | | | | | | 2012$^{a,b,c,d,e,f}$ | 2005$^{g}$ |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Families | | Species | | S1 | S2 | S3 | S4 | S5 | S6 | | |
| Noctuidae | 밤나방과 | *Edessena hamada* | 쌍복판눈수염나방 | 3 | 3 | – | – | – | – | 2 | 2 |
| | | *Ercheia niveostrigata* | 청백무늬밤나방 | 3 | 3 | – | 2 | 2 | – | 5 | 1 |
| | | *Ercheia umbrosa* | 보라무늬밤나방 | 2 | 2 | 2 | 2 | 2 | – | – | 1 |
| | | *Erebus ephesperis* | 왕흰줄태극나방 | – | – | – | – | – | – | 1 | 1 |
| | | *Erygia apicalis* | 구름잎밤나방 | – | – | – | 1 | 2 | – | 2 | 2 |
| | | *Erythroplusia pyropia* | 붉은등은무늬밤나방 | – | – | – | – | – | – | 2 | – |
| | | *Erythroplusia rutilifrons* | 꼬마은무늬밤나방 | – | – | – | – | – | – | – | 1 |
| | | *Eutelia geyeri* | 비행기밤나방 | – | – | – | – | – | – | 1 | 1 |
| | | *Euwilemania angulata* | 우묵날개짤름나방 | – | – | – | – | – | – | – | 2 |
| | | *Euxoa sibirica* | 시베리아밤나방 | – | – | – | – | – | – | – | 1 |
| | | *Gabala argentata* | 은무늬모진애기밤나방 | – | – | – | – | – | – | – | 1 |
| | | *Gadirtha uniformis* | 남방껍질밤나방 | – | – | – | – | – | – | – | 1 |
| | | *Gelastocera exusta* | 검은띠애기나방 | – | – | – | 1 | – | – | – | – |
| | | *Gelastocera exusta* | 검은띠애기밤나방 | – | – | – | – | – | – | – | 1 |
| | | *Gerbathodes angusta* | 애저녁나방 | – | – | – | – | – | – | – | 1 |
| | | *Gonepatica opalina* | 붉은띠짤름나방 | – | – | – | – | – | – | – | 4 |
| | | *Hadena rivularis* | 줄흰무늬밤나방 | – | – | – | – | – | – | 1 | – |
| | | *Hadennia incongruens* | 검은띠수염나방 | – | 2 | – | – | – | – | – | – |
| | | *Hadjina chinensis* | 중국두점박이밤나방 | – | – | – | – | – | – | 2 | 1 |
| | | *Helicoverpa armigera* | 왕담배나방 | – | – | – | – | – | – | 3 | – |
| | | *Helicoverpa assulta* | 담배나방 | – | – | – | – | – | – | 2 | 1 |
| | | *Hemipsectra fallax* | 외별짤름나방 | – | – | – | – | – | – | – | 1 |
| | | *Herminia arenosa* | 세줄무늬수염나방 | – | – | 1 | – | – | – | 1 | 1 |
| | | *Herminia dolosa* | 마른잎수염나방 | – | 1 | 1 | – | – | – | 1 | – |
| | | *Herminia innocens* | 물결수염나방 | – | – | 1 | – | – | – | – | 1 |
| | | *Herminia tarsicrinalis* | 갈색줄수염나방 | – | – | – | – | 1 | 1 | 2 | 1 |
| | | *Herminia tarsicrinalis* | 갈색줄수염나방 | – | – | – | – | – | – | – | 3 |
| | | *Hermonassa cecilia* | 점박이밤나방 | – | – | – | 2 | 2 | – | 3 | 1 |
| | | *Hipoepa fractalis* | 꽃날개수염나방 | – | – | – | – | – | – | 1 | – |
| | | *Hoplodrina implacata* | 주을밤나방 | – | – | – | – | – | – | 1 | – |
| | | *Hydrillodes funeralis* | 넓은띠담흑수염나방 | 7 | 3 | 4 | 3 | 4 | 5 | 6 | 1 |
| | | *Hydrillodes pacificus* | 담흑수염나방 | 5 | 3 | 3 | 4 | 5 | – | – | – |
| | | *Hypena* (*Bomolocha*) *bicoloralis* | 활무늬수염나방 | – | – | – | – | – | – | 2 | 1 |
| | | *Hypena amica* | 뒷노랑수염나방 | – | – | – | 1 | 1 | – | 1 | – |
| | | *Hypena claripennis* | 각시뒷노랑수염나방 | – | 1 | – | – | – | – | 6 | 1 |
| | | *Hypena trigonalis* | 대만수염나방 | – | – | 1 | – | – | – | 1 | 1 |
| | | *Hypena* (*Bomolocha*) *nigrobasalis* | 별보라수염나방 | – | – | – | – | – | – | 1 | – |
| | | *Hypenodes curvilinea* | 흰줄꼬마짤름나방 | – | – | 1 | – | – | – | – | – |
| | | *Hyperstrotia flavipuncta* | 검은두줄꼬마밤나방 | 1 | – | – | – | – | – | – | 1 |
| | | *Hypersypnoides submarginata* | 검스레흰별밤나방 | – | – | – | – | – | – | 1 | – |
| | | *Hypopyra vespertilio* | 큰갈색띠밤나방 | – | – | – | – | – | – | 1 | – |
| | | *Hyposada brunnea* | 줄무늬꼬마밤나방 | – | – | – | – | – | – | 2 | – |
| | | *Hyposemansis albipuncta* | 날개물결무늬밤나방 | – | – | – | 1 | – | – | – | – |

**Appendix 1.** Continued

| Scientific name | | | | 2016 | | | | | | 2012$^{a,b,c,d,e,f}$ | 2005$^{g}$ |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Families | | Species | | S1 | S2 | S3 | S4 | S5 | S6 | | |
| Noctuidae | 밤나방과 | *Idia curvipalpis* | 복판눈밤나방 | – | 1 | – | – | – | – | 1 | – |
| | | *Iragaodes nobilis* | 앞노랑모밤나방 | – | 1 | – | – | – | – | – | 1 |
| | | *Lacera procellosa* | 울퉁불퉁밤나방 | – | – | – | – | – | – | – | 1 |
| | | *Lagoptera juno* | 무궁화밤나방 | – | – | – | – | – | – | 5 | 1 |
| | | *Leiostola mollis* | 쌍줄짤름나방 | – | 1 | 1 | – | 1 | – | – | 3 |
| | | *Lophomilia polybapta* | 얼룩짤름나방 | – | – | – | – | – | 1 | – | 2 |
| | | *Lophoptera hayesi* | 가는흑갈색밤나방 | – | – | – | – | – | – | – | 1 |
| | | *Lophoruza pulcherrima* | 꽃꼬마밤나방 | – | 1 | – | – | – | 2 | 6 | – |
| | | *Lygephila craccae* | 잿빛목검은밤나방 | – | – | – | 1 | – | – | – | – |
| | | *Lygephila maxima* | 큰목검은밤나방 | – | 1 | 1 | 2 | – | – | 1 | – |
| | | *Lygephila vulcanea* | 갈색목검은밤나방 | 1 | 1 | – | – | – | – | 4 | – |
| | | *Macdunnoughia hybrida* | 사촌은무늬밤나방 | – | – | – | – | – | 1 | – | – |
| | | *Macdunnoughia purissima* | 은무늬밤나방 | – | – | – | – | – | – | 2 | 1 |
| | | *Maguda suffusa* | 참새짤름나방 | – | – | – | – | – | – | – | 1 |
| | | *Maliattha rosacea* | 장미꼬마밤나방 | – | – | – | – | – | – | 1 | – |
| | | *Maliattha signifera* | 넓은띠흰꼬마밤나방 | – | – | – | – | – | – | 1 | 4 |
| | | *Mecodina cineracea* | 굴뚝애기잎밤나방 | – | – | – | – | – | – | 1 | – |
| | | *Mecodina nubiferalis* | 남방구리밤나방 | – | – | – | 1 | 1 | 1 | 3 | 2 |
| | | *Metopta rectifasciata* | 흰줄태극나방 | – | 2 | 2 | – | – | 1 | 3 | 1 |
| | | *Microxyla confusa* | 세모무늬꼬마밤나방 | – | – | – | – | – | – | 1 | 5 |
| | | *Mimachrostia fasciata* | 검은줄노랑짤름나방 | – | – | – | – | – | – | – | 2 |
| | | *Mimeusemia persimilis* | 애기얼룩나방 | – | – | – | – | – | – | – | 1 |
| | | *Mocis ancilla* | 꼬마구름무늬밤나방 | – | – | – | – | – | – | 2 | 1 |
| | | *Mocis annetta* | 구름무늬밤나방 | – | – | – | – | – | – | 1 | 1 |
| | | *Moma tsushimana* | 비바리저녁나방 | – | – | – | – | – | – | – | 1 |
| | | *Mythimna* (*Aletia*) *flavostigma* | 얼룩줄무늬밤나방 | – | – | – | – | – | – | – | 1 |
| | | *Mythimna* (*Aletia*) *nigrilinea* | 검은띠줄무늬밤나방 | – | – | – | – | – | – | 1 | – |
| | | *Mythimna* (*Aletia*) *placida* | 뒷검은줄무늬밤나방 | – | – | – | – | – | – | – | 1 |
| | | *Mythimna* (*Analetia*) *postica* | 갈색점밤나방 | – | 1 | – | – | – | – | – | – |
| | | *Mythimna matsumuriana* | 깊은산띠밤나방 | – | – | – | – | – | – | – | 1 |
| | | *Mythimna stolida* | 큰점박이줄무늬밤나방 | – | – | – | – | – | – | – | 1 |
| | | *Mythimna turca* | 쌍띠밤나방 | 2 | – | – | – | – | – | 3 | 2 |
| | | *Naenia contaminata* | 더러운밤나방 | – | – | – | – | – | – | 1 | – |
| | | *Naganoella timandra* | 신부짤름나방 | – | 2 | – | – | – | – | – | – |
| | | *Naranga aenescens* | 벼애나방 | 1 | – | – | – | – | 1 | 3 | 1 |
| | | *Necodina subviolacea* | 보라애기잎밤나방 | – | – | – | – | – | – | 1 | 1 |
| | | *Negritothoripa hampsoni* | 흰무늬껍질밤나방 | – | – | – | – | – | – | 1 | 1 |
| | | *Neustrotia rectilineata* | 아리랑꼬마밤나방 | – | – | – | – | – | – | – | 3 |
| | | *Niphonyx segregata* | 엉겅퀴밤나방 | 2 | 1 | – | – | – | – | 4 | 2 |
| | | *Nodaria tristis* | 굵은수염나방 | – | – | – | – | – | – | – | 1 |
| | | *Nonagria turpis* | 어두운벼밤나방 | – | – | – | – | – | – | – | 1 |
| | | *Oligia fodinae* | 사각무늬밤나방 | – | – | – | – | – | – | 1 | – |
| | | *Oligonyx vulnerata* | 끝갈색밤나방 | – | – | – | – | – | – | – | 2 |

**Appendix 1.** Continued

| Scientific name | | | | 2016 | | | | | | 2012[a,b,c,d,e,f] | 2005[g] |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Families | | Species | | S1 | S2 | S3 | S4 | S5 | S6 | | |
| Noctuidae | 밤나방과 | *Olivenebula oberthueri* | 큰뒷노랑밤나방 | – | – | – | – | – | – | 1 | – |
| | | *Ophiusa tirhaca* | 황색검은점띠밤나방 | – | – | – | – | – | – | 1 | – |
| | | *Oraesia emarginata* | 작은갈고리밤나방 | – | – | – | – | – | – | 1 | 1 |
| | | *Oraesia excavata* | 붉은갈고리밤나방 | – | – | – | – | – | – | – | 2 |
| | | *Orthogonia sera* | 모진밤나방 | – | – | – | – | – | – | – | 1 |
| | | *Oruza divisa* | 흰띠꼬마밤나방 | – | – | – | – | – | – | 1 | – |
| | | *Oruza glaucotorna* | 흰무늬꼬마밤나방 | – | – | – | – | – | – | 1 | – |
| | | *Oruza kunsuki* | 백운꼬마밤나방 | – | – | – | – | – | 1 | 1 | – |
| | | *Oruza mira* | 노랑줄꼬마밤나방 | – | – | – | – | 1 | – | – | – |
| | | *Ozarba punctigera* | 곧은띠꼬마밤나방 | – | – | – | – | – | – | 7 | 1 |
| | | *Pangrapta albistigma* | 별박이짤름나방 | – | – | – | 1 | – | – | 1 | 1 |
| | | *Pangrapta costinotata* | 은무늬짤름나방 | – | – | – | – | – | – | 2 | – |
| | | *Pangrapta curtalis* | 끝짤름나방 | – | – | – | – | – | – | – | 2 |
| | | *Pangrapta flavomacula* | 흰줄짤름나방 | – | – | – | 1 | – | – | 2 | 1 |
| | | *Pangrapta obscurata* | 검은끝짤름나방 | – | – | – | – | – | – | – | 4 |
| | | *Pangrapta perturbans* | 산그물무늬짤름나방 | – | 2 | 1 | 2 | 1 | 1 | 5 | 1 |
| | | *Pangrapta trilineata* | 세줄끝무늬짤름나방 | – | – | 1 | – | – | – | – | 4 |
| | | *Pangrapta trimantesalis* | 연무늬끝짤름나방 | – | – | – | – | – | – | – | 1 |
| | | *Panthea coenobita* | 솔버짐나방 | – | – | – | – | – | – | 2 | 1 |
| | | *Paracolax fentoni* | 잔물결수염나방 | – | – | – | – | – | – | 1 | – |
| | | *Paracolax pryeri* | 흰점보라수염나방 | – | – | – | – | – | – | 1 | – |
| | | *Paragabara flavomacula* | 꼬마보라짤름나방 | – | – | – | – | – | – | 1 | 3 |
| | | *Paragona inchoata* | 담흑꼬마짤름나방 | – | – | – | – | – | – | – | 1 |
| | | *Perinaenia accipiter* | 나무결밤나방 | – | – | – | – | – | – | – | 1 |
| | | *Perynea ruficeps* | 팔혹점꼬마밤나방 | – | – | – | – | – | – | 2 | – |
| | | *Perynea subrosea* | 점분홍꼬마밤나방 | – | 1 | – | – | – | – | 1 | 1 |
| | | *Plusia festucae* | 벼금무늬밤나방 | – | – | – | – | – | – | 3 | – |
| | | *Plusia putnami* | 적갈금무늬밤나방 | – | – | – | – | – | 1 | – | 1 |
| | | *Plusiodonta casta* | 은무늬갈고리밤나방 | – | – | – | – | – | 1 | 4 | 1 |
| | | *Polyphaenis subviridis* | 회록색밤나방 | – | – | – | – | – | – | – | 1 |
| | | *Protodeltote pygarga* | 띠꼬마밤나방 | – | – | – | – | – | – | – | 2 |
| | | *Protomiselia bilinea* | 일본두줄밤나방 | – | – | – | – | – | – | 3 | – |
| | | *Pseudaletia separata* | 멸강나방 | – | – | – | – | – | – | 4 | 1 |
| | | *Pseudoips fagana* | 쌍줄푸른밤나방 | 3 | 3 | – | – | – | 2 | 5 | 1 |
| | | *Rhynchina cramboides* | 줄꼬마수염나방 | – | – | – | – | – | – | 1 | – |
| | | *Rivula inconspicua* | 두점짤름나방 | – | – | – | – | – | – | – | 1 |
| | | *Sarbanissa subflava* | 뒷노랑얼룩나방 | – | – | – | – | – | – | – | 2 |
| | | *Sarbanissa venusta* | 기생얼룩나방 | – | – | – | – | – | – | – | 1 |
| | | *Scedopla koreana* | 알락무늬수염나방 | 1 | 1 | – | – | – | – | – | – |
| | | *Sesamia inferens* | 벼밤나방 | – | – | – | – | – | – | 1 | – |
| | | *Sideridis unica* | 각시보라밤나방 | – | – | – | – | – | – | – | 1 |
| | | *Siglophora sanguinolenta* | 붉은무늬갈색밤나방 | 2 | – | – | – | – | 1 | 3 | – |
| | | *Simplicia niphona* | 곧은띠수염나방 | – | – | – | – | – | – | 6 | 1 |

**Appendix 1.** Continued

| Scientific name | | | | 2016 | | | | | | 2012[a,b,c,d,e,f] | 2005[g] |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Families | | Species | | S1 | S2 | S3 | S4 | S5 | S6 | | |
| Noctuidae | 밤나방과 | *Simplicia rectalis* | 앞붉은수염나방 | – | – | – | – | – | – | – | 1 |
| | | *Sineugraphe bipartita* | 담색쌍검은밤나방 | – | – | 1 | – | – | – | 2 | – |
| | | *Sineugraphe exusta* | 쌍검은밤나방 | – | – | – | – | – | – | 1 | 1 |
| | | *Sineugraphe oceanica* | 물결쌍검은밤나방 | 1 | 1 | 2 | 1 | – | 1 | 2 | 1 |
| | | *Sphragifera biplagiata* | 꼬마봉인밤나방 | 2 | 2 | – | 2 | – | 2 | 4 | 7 |
| | | *Spirama helicina* | 톱니태극나방 | – | – | – | – | – | – | 2 | 1 |
| | | *Spirama retorta* | 태극나방 | 2 | – | – | – | 1 | 1 | 3 | 1 |
| | | *Spodoptera depravata* | 잔디밤나방 | – | – | – | – | – | 1 | 2 | – |
| | | *Spodoptera exigua* | 파밤나방 | – | – | – | – | – | – | 3 | 1 |
| | | *Spodoptera litura* | 담배거세미나방 | – | – | – | – | – | – | 1 | 1 |
| | | *Spodoptera pecten* | 남방빗살수염밤나방 | – | – | – | – | – | – | 1 | – |
| | | *Stenhypena nigripunctata* | 민무늬노랑수염나방 | – | – | – | – | – | – | – | 1 |
| | | *Stenoloba clara* | 꼬마이끼밤나방 | – | – | – | – | – | – | 1 | – |
| | | *Sypnoides picta* | 흰줄썩은잎밤나방 | – | 2 | – | – | – | – | – | 2 |
| | | *Trachea atriplicis* | 메밀거세미나방 | – | – | – | – | – | – | 2 | 2 |
| | | *Trichoplusia ni* | 양배추은무늬밤나방 | – | – | – | – | – | – | 1 | – |
| | | *Trotosema sordidum* | 총채수염나방 | – | – | – | – | – | 1 | 2 | 1 |
| | | *Virgo datanidia* | 뾰족밤나방 | – | – | – | – | – | – | 1 | – |
| | | *Xestia c-nigrum* | 씨자무늬거세미밤나방 | – | – | – | – | – | – | – | 1 |
| | | *Xestia stupenda* | 앞노랑점밤나방 | – | – | – | – | – | – | 2 | 1 |
| | | *Zanclognatha fumosa* | 지옥수염나방 | 1 | – | – | – | – | – | – | – |
| | | *Zanclognatha helva* | 노랑수염나방 | – | – | – | – | – | – | – | 1 |
| | | *Zanclognatha leechi* | 리치수염나방 | – | – | – | – | – | – | 2 | – |
| | | *Zanclognatha lunalis* | 혹수염나방 | – | – | – | – | – | – | 2 | – |
| | | *Zanclognatha lunalis* | 흑수염나방 | – | – | – | 1 | – | – | – | – |
| | | *Zanclognatha stramentacealis* | 뒷밝은줄무늬수염나방 | – | – | – | – | 1 | – | 1 | – |
| | | *Zanclognatha sugii* | 끝점혹수염나방 | – | – | – | 1 | 1 | – | – | 1 |
| Arctiidae | 불나방과 | *Aglaeomorpha histrio* | 흰무늬왕불나방 | – | – | – | – | – | – | 1 | 1 |
| | | *Agrisius fuliginosus* | 점박이불나방 | – | 1 | – | – | – | – | – | – |
| | | *Asuridia carnipicta* | 눈무늬점불나방 | – | – | – | – | – | – | – | 1 |
| | | *Chionarctia nivea* | 흰제비불나방 | – | – | – | – | – | – | 1 | – |
| | | *Cyana hamata* | 붉은줄불나방 | – | – | – | – | – | – | – | 1 |
| | | *Eilema griseola* | 노랑테불나방 | – | – | – | – | – | – | – | 1 |
| | | *Eilema japonica* | 각시불나방 | – | – | – | – | – | – | – | 1 |
| | | *Eilema nankingica* | 앞노랑불나방 | – | – | – | – | – | – | – | 2 |
| | | *Hyphanria cunea* | 미국흰불나방 | – | – | – | – | – | – | – | 1 |
| | | *Lithosia quadra* | 넉점박이불나방 | – | – | – | – | – | – | – | 1 |
| | | *Miltochrista aberrans* | 교차무늬주홍테불나방 | 1 | – | – | – | – | – | 1 | 1 |
| | | *Miltochrista miniata* | 주홍테불나방 | – | – | – | – | – | – | – | 1 |
| | | *Miltochrista pallida* | 노랑불나방 | – | – | – | – | – | – | 2 | 1 |
| | | *Miltochrista striata* | 홍줄불나방 | 2 | 2 | – | – | 2 | – | 1 | 2 |
| | | *Miltochrista ziczac* | 톱날무늬노랑불나방 | – | 1 | – | – | – | – | 1 | 1 |
| | | *Paraona staudingeri* | 목도리불나방 | 2 | 1 | – | – | – | – | 1 | 4 |

**Appendix 1.** Continued

| Scientific name | | | | 2016 | | | | | | $2012^{a,b,c,d,e,f}$ | $2005^{g}$ |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Families | | Species | | S1 | S2 | S3 | S4 | S5 | S6 | | |
| Arctiidae | 불나방과 | *Parasiccia altaica* | 좀점박이불나방 | – | – | – | – | – | 1 | – | – |
| | | *Rhyparioides amurensis* | 별박이안주홍불나방 | – | – | – | – | – | – | – | 1 |
| | | *Rhyparioides subvaius* | 좀안주홍불나방 | – | – | – | – | – | – | – | 1 |
| | | *Spilarctia luteum* | 외줄점불나방 | – | – | – | – | – | – | 1 | 1 |
| | | *Spilarctia seriatopunctata* | 줄점불나방 | – | 3 | – | – | – | – | 7 | 1 |
| | | *Spilarctia subcarnea* | 배붉은흰불나방 | – | – | – | – | – | – | 1 | 2 |
| | | *Spilosoma imparilis* | 수검은줄점불나방 | – | – | – | – | – | – | 1 | 1 |
| | | *Spilosoma lubricipeda* | 배점무늬불나방 | – | – | – | – | – | – | 1 | 1 |
| | | *Spilosoma punctaria* | 점무늬불나방 | – | – | – | – | – | – | – | 1 |
| | | *Stigmatophora flava* | 알락노랑불나방 | – | – | – | – | – | – | 1 | 2 |
| | | *Stigmatophora leacrita* | 민무늬알락노랑불나방 | – | – | – | – | – | – | – | 1 |
| | | *Stigmatophora micans* | 점박이알락노랑불나방 | – | – | – | – | – | – | 1 | – |
| Thyatiridae | 뾰족날개나방과 | *Habrosyne aurorina* | 애기담홍뾰족날개나방 | – | 2 | 2 | – | – | – | 1 | 1 |
| | | *Habrosyne pyritoides* | 흰뾰족날개나방 | – | – | – | – | – | – | 1 | 1 |
| | | *Tethea albicostata* | 앞흰뾰족날개나방 | – | – | – | – | – | – | 2 | 1 |
| | | *Tethea ampliata* | 넓은뾰족날개나방 | 3 | 2 | – | – | – | – | 1 | 1 |
| | | *Tethea consimilis* | 홍백띠뾰족날개나방 | – | – | – | – | – | – | 1 | 1 |
| | | *Tethea octogesima* | 좁은뾰족날개나방 | – | – | – | – | – | – | 4 | – |
| | | *Thyatira batis* | 무늬뾰족날개나방 | 1 | 2 | – | 2 | – | – | 2 | 1 |
| Gelechiidae | 뿔나방과 | *Brachmia modicella* | 가랑잎뿔나방 | – | – | – | – | – | – | – | 12 |
| | | *Chorivalva bisaccula* | 참털주머니뿔나방 | – | – | – | – | – | – | – | 1 |
| | | *Chorivalva grandialata* | 얼룩무늬뿔나방 | – | – | – | – | – | – | – | 1 |
| | | *Dichomeris lespedezae* | 싸리삼각수염뿔나방 | – | – | – | – | – | – | – | 1 |
| | | *Dichomeris rasilella* | 쑥잎말이뿔나방 | – | – | – | – | – | – | – | 2 |
| | | *Dichomeris strictella* | 삼각수염뿔나방 | – | – | – | – | – | – | – | 1 |
| | | *Dichomeris ustalella* | 큰털보뿔나방 | – | – | – | – | – | – | 1 | – |
| | | *Hypatima excellentella* | 털수염뿔나방 | – | – | – | – | – | – | – | 1 |
| | | *Hypatima obscurella* | 동방수염뿔나방 | – | – | – | – | – | – | – | 10 |
| | | *Teleiodes yanyangensis* | 여름살이비늘뿔나방 | – | – | – | – | – | – | – | 1 |
| | | *Telphusa argobathra* | 검은날개뿔나방 | – | – | – | – | – | – | – | 2 |
| | | *Tornodoxa longiella* | 긴날개털수염뿔나방 | – | – | – | – | – | – | – | 2 |
| Lecithoceridae | 뿔나방붙이과 | *Halolaguna sublaxata* | 세점남방뿔나방 | – | – | – | – | – | – | – | 5 |
| | | *Odites xenophaea* | 사과잎뿔나방 | – | – | – | – | – | – | 1 | – |
| Saturniidae | 산누에나방과 | *Actias artemis* | 긴꼬리산누에나방 | – | – | – | – | – | – | 2 | – |
| | | *Actias gnoma* | 옥색긴꼬리산누에나방 | – | – | – | – | – | – | 1 | 1 |
| | | *Antheraea yamamai* | 참나무산누에나방 | – | – | – | – | – | – | 1 | – |
| | | *Samia cynthia* | 가중나무고치나방 | – | – | – | – | – | – | – | 1 |
| Lasiocampidae | 솔나방과 | *Dendrolimus spectabilis* | 솔나방 | – | – | – | – | – | – | – | 1 |
| | | *Malacosoma neustria* | 천막벌레나방(텐트나방) | – | – | – | – | – | – | 2 | 1 |
| | | *Odonestis pruni* | 사과나무나방 | 1 | 1 | – | 1 | – | 1 | 2 | – |
| | | *Paralebeda plagiata* | 대만나방 | – | – | – | – | – | – | 1 | – |
| Epiplemidae | 쌍꼬리나방과 | *Epiplema moza* | 흑점쌍꼬리나방 | – | – | – | – | – | – | 1 | 1 |
| | | *Epiplema plagifera* | 검은띠쌍꼬리나방 | – | – | – | – | – | – | 2 | 1 |

**Appendix 1.** Continued

| Scientific name | | | | 2016 | | | | | | $2012^{a,b,c,d,e,f}$ | $2005^{g}$ |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Families | | Species | | S1 | S2 | S3 | S4 | S5 | S6 | | |
| Limacodidae | 쐐기나방과 | *Belippa horrida* | 끝검은쐐기나방 | – | – | – | – | – | – | – | 2 |
| | | *Latoia consocia* | 장수쐐기나방 | – | – | 1 | – | – | 1 | 3 | 1 |
| | | *Latoia sinica* | 뒷검은푸른쐐기나방 | 2 | 2 | – | – | 1 | – | 2 | 5 |
| | | *Microleon longipalpis* | 꼬마쐐기나방 | – | 1 | – | – | – | – | – | 13 |
| | | *Monema flavescens* | 노랑쐐기나방 | 2 | 2 | 1 | – | – | 2 | 5 | 1 |
| | | *Narosa fulgens* | 꼬마얼룩무늬쐐기나방 | 1 | 2 | 3 | – | 2 | 2 | 5 | 1 |
| | | *Phlossa conjuncta* | 남방쐐기나방 | – | 1 | – | – | 1 | 1 | 5 | 3 |
| | | *Phrixolepia sericea* | 흑색무늬쐐기나방 | – | – | – | – | – | – | – | 3 |
| | | *Rhamnosa angulata* | 참쐐기나방 | 2 | 2 | 2 | 2 | 2 | 2 | – | – |
| | | *Thosea sinensis coreana* | 극동쐐기나방 | 2 | 2 | 1 | 3 | 2 | 1 | 5 | 1 |
| Zygaenidae | 알락나방과 | *Chalcosia remota* | 뒤흰띠알락나방 | – | – | – | – | – | – | 2 | 4 |
| | | *Pidorus glaucopis* | 흰띠알락나방 | – | – | – | – | – | – | 1 | 7 |
| | | *Pryeria sinica* | 노랑털알락나방 | – | – | – | – | – | – | 2 | – |
| Ctenuchidae | 애기나방과 | *Amata germana* | 노랑애기나방 | – | – | – | – | – | – | 2 | 1 |
| Brahmaeidae | 왕물결나방과 | *Brahmaea certhia* | 왕물결나방 | – | 2 | – | – | – | – | 1 | 1 |
| Oecophoridae | 원뿔나방과 | *Acria ceramitis* | 우묵날개원뿔나방 | – | – | – | – | – | – | 1 | 1 |
| | | *Cryptolechia malacobyrsa* | 갈색띠원뿔나방 | – | – | – | – | – | – | 4 | 149 |
| | | *Periacma delegata* | 노랑날개원뿔나방 | – | – | – | – | – | – | – | 2 |
| | | *Promalactis odaiensis* | 솔피원뿔나방 | – | – | – | – | – | – | 1 | – |
| | | *Promalactis suzukiella* | 구슬무늬원뿔나방 | – | – | – | – | – | – | – | 2 |
| | | *Tyrolimnas anthraconesa* | 애기원뿔나방 | – | – | – | – | – | – | 1 | – |
| Sessidae | 유리나방과 | *Nokona pernix* | 배노랑줄유리나방 | – | – | – | – | – | – | – | 1 |
| Tortricidae | 잎말이나방과 | *Acleris affinatana* | 상수리잎말이나방 | – | – | – | – | – | – | – | 1 |
| | | *Adoxophyes orana* | 애모무늬잎말이나방 | – | – | – | – | – | – | 5 | – |
| | | *Ancylis uncella* | 뾰족날개애기잎말이나방 | – | – | – | – | – | – | – | 1 |
| | | *Archips ingentanus* | 왕사과잎말이나방 | – | – | – | – | – | – | – | 1 |
| | | *Archips semistructus* | 딸기잎말이나방 | – | – | – | – | – | – | 1 | – |
| | | *Argyrotaenia congruentana* | 반달무늬잎말이나방 | – | – | – | – | – | – | 1 | – |
| | | *Bactra furfurana* | 속애기잎말이나방 | – | – | – | – | – | – | – | 1 |
| | | *Clepsis rurinana* | 반백잎말이나방 | – | – | – | – | – | – | – | 1 |
| | | *Endothenia banausopis* | 흰끝애기잎말이나방 | – | – | – | – | – | – | – | 1 |
| | | *Endothenia remigera* | 검정애기잎말이나방 | – | – | – | – | – | – | – | 1 |
| | | *Epiblema foenella* | 흰갈퀴애기잎말이나방 | – | 1 | – | – | – | – | 5 | 1 |
| | | *Epinotia bicolor* | 노랑줄애기잎말이나방 | – | – | – | – | 1 | – | 1 | – |
| | | *Epinotia rubiginosana koraiensis* | 잣애기잎말이나방 | – | – | – | – | – | – | – | 1 |
| | | *Eubrochoneura altissima* | 흑색꼬마애기잎말이나방 | – | – | – | – | – | – | – | 1 |
| | | *Eucosma catharaspis* | 갈색애기잎말이나방 | – | – | – | – | – | – | 1 | – |
| | | *Fulcrifera orientis* | 오리엔트애기잎말이나방 | – | – | – | – | – | – | – | 1 |
| | | *Gnorismoneura hoshinoi* | 꼬마무늬잎말이나방 | – | – | – | – | – | – | – | 1 |
| | | *Grapholita delineana* | 네줄애기잎말이나방 | – | – | – | – | – | – | 1 | – |
| | | *Hedya auricristana* | 괴불왕애기잎말이나방 | – | – | – | – | – | – | – | 2 |
| | | *Hedya walsinghami* | 장미애기잎말이나방 | – | – | – | – | – | – | – | 1 |

**Appendix 1.** Continued

| Scientific name | | | | 2016 | | | | | | $2012^{a,b,c,d,e,f}$ | $2005^{g}$ |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Families | | Species | | S1 | S2 | S3 | S4 | S5 | S6 | | |
| Tortricidae | 잎말이나방과 | *Homona issikii* | 삼나무잎말이나방 | – | – | – | – | – | – | – | 1 |
| | | *Homona magnanima* | 차잎말이나방 | – | – | – | – | – | – | 3 | 3 |
| | | *Hoshinoa longicellana* | 사과잎말이나방 | – | – | – | – | – | – | – | 8 |
| | | *Hystrichosolus spathanum* | 무늬참나무애기잎말이나방 | – | – | – | – | – | – | – | 3 |
| | | *Meganola costalis* | 앞검은혹나방 | – | – | – | – | – | – | – | 2 |
| | | *Olethreutes orthocosma* | 노랑무늬애기잎말이나방 | – | – | – | – | – | – | – | 11 |
| | | *Pandemis corylana* | 치악잎말이나방 | – | – | – | – | – | – | – | 12 |
| | | *Pseudacroclita hapalaspis* | 산딸기애기잎말이나방 | – | – | – | – | – | – | – | 1 |
| | | *Pseudohedya retracta* | 왕귤빛애기잎말이나방 | – | – | – | – | – | – | – | 1 |
| | | *Spilonota semirufana* | 고동색애기잎말이나방 | – | – | – | – | – | – | – | 1 |
| | | *Stenbergmania albomaculalis* | 앞점노랑짤름나방 | – | – | – | – | – | – | – | 1 |
| Geometridae | 자나방과 | *Abraxas latifasciata* | 참빗살얼룩가지나방 | – | 1 | – | – | – | – | 4 | – |
| | | *Abraxas niphonibia* | 각시얼룩가지나방 | – | – | – | – | – | – | 1 | 14 |
| | | *Agathia carissima* | 검띠푸른자나방 | 1 | – | – | 1 | – | – | 4 | – |
| | | *Agathia visenda* | 검띠발푸른자나방 | – | – | – | – | – | – | – | 1 |
| | | *Alcis angulifera* | 털뿔가지나방 | – | – | – | – | – | – | – | 1 |
| | | *Amraica superans* | 노박덩굴가지나방 | – | – | – | – | – | – | 1 | 3 |
| | | *Angerona prunaria* | 오얏나무가지나방 | – | 4 | – | – | – | – | 1 | – |
| | | *Apopetelia chlororphnodes* | 끝회색붉은가지나방 | 1 | – | – | – | – | – | – | – |
| | | *Arichanna melanaria* | 뒷노랑점가지나방 | – | 3 | – | – | – | – | 1 | – |
| | | *Ascotis imparata* | 남방네눈쑥가지나방 | – | – | – | – | – | – | – | 5 |
| | | *Ascotis selenaria* | 네눈쑥가지나방 | – | 2 | – | – | – | 1 | 6 | 1 |
| | | *Biston regalis* | 불회색가지나방 | – | – | – | – | – | – | 1 | – |
| | | *Bizia aexaria* | 끝갈색가지나방 | – | – | – | – | – | – | 1 | – |
| | | *Bizia altera* | 큰끝갈색가지나방 | – | – | – | – | – | – | – | 1 |
| | | *Calleulype whitelyi* | 뒷노랑흰물결자나방 | – | 1 | – | – | – | – | – | – |
| | | *Chariaspilates formosaria* | 은줄가지나방 | – | – | – | – | – | – | 1 | – |
| | | *Chiasmia cinerearia* | 줄마디가지나방 | – | 1 | – | – | – | – | 1 | – |
| | | *Chiasmia defixaria* | 두줄점가지나방 | – | 1 | – | – | 2 | 2 | 6 | 3 |
| | | *Chiasmia hebesata* | 세줄점가지나방 | – | 1 | 2 | – | – | 1 | 6 | 3 |
| | | *Chlorissa obliterata* | 애기푸른자나방 | – | – | – | – | – | – | 1 | – |
| | | *Chloromachia infracta* | 흰애기푸른자나방 | – | – | – | – | – | – | 2 | 1 |
| | | *Cleora repulsaria* | 굵은줄가지나방 | – | – | – | – | – | – | 1 | 1 |
| | | *Comibaena amoenaria* | 네점푸른자나방 | 2 | – | – | – | 1 | – | 3 | 3 |
| | | *Comibaena argentataria* | 쌍눈푸른자나방 | – | – | – | – | – | – | 1 | 1 |
| | | *Comibaena delicatior* | 붉은무늬푸른자나방 | 1 | – | – | – | – | – | – | 1 |
| | | *Comibaena procumbaria* | 무늬박이푸른자나방 | – | – | – | – | – | – | 5 | 1 |
| | | *Comibaena tenuisaria* | 큰무늬박이푸른자나방 | – | – | – | – | – | – | – | 1 |
| | | *Comostola subtiliaria* | 애기네눈박이푸른자나방 | – | – | – | – | – | – | – | 2 |
| | | *Corymica specularia* | 큰노랑애기가지나방 | 1 | 1 | – | – | – | – | 1 | – |
| | | *Cotta incongruaria* | 연노랑세줄가지나방 | – | – | – | – | – | – | – | 1 |
| | | *Ctenognophos grandinaria* | 세줄노랑가지나방 | – | – | – | – | – | – | – | 1 |

**Appendix 1.** Continued

| Scientific name | | | | 2016 | | | | | | 2012[a,b,c,d,e,f] | 2005[g] |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Families | | Species | | S1 | S2 | S3 | S4 | S5 | S6 | | |
| Geometridae | 자나방과 | *Culcula panterinaria* | 노랑띠알락가지나방 | 3 | 2 | 2 | – | – | 2 | 4 | 1 |
| | | *Deileptenia rebeata* | 솔검은가지나방 | – | – | 1 | – | – | – | – | – |
| | | *Dilophodes parvularia* | 배털가지나방 | – | – | – | – | – | – | – | 6 |
| | | *Dindica virescens* | 각시자나방 | – | – | 3 | 3 | 2 | – | 1 | 1 |
| | | *Diplodesma ussuriaria* | 두줄푸른자나방 | – | – | – | – | – | – | – | 16 |
| | | *Duliophyle agitata* | 넓은띠큰가지나방 | – | – | – | – | – | – | 1 | – |
| | | *Duliophyle majuscularia* | 누런큰가지나방 | – | – | – | – | – | – | 1 | 1 |
| | | *Ecliptopera umbrosaria* | 큰톱날물결자나방 | – | – | 2 | – | – | – | 4 | 1 |
| | | *Ectephrina semilutea* | 네줄점가지나방 | – | – | – | – | – | – | – | 1 |
| | | *Ectropis aigneri* | 연회색가지나방 | – | 1 | 1 | – | – | – | 2 | – |
| | | *Ectropis crepuscularia* | 날개물결가지나방 | – | – | – | – | – | – | – | 1 |
| | | *Ectropis excellens* | 줄고운가지나방 | 3 | 3 | 3 | 2 | 2 | 2 | 4 | 3 |
| | | *Eilicrinia paryula* | 노랑귀무늬가지나방 | – | – | – | – | – | – | – | 1 |
| | | *Eupithecia tabidaria* | 배노랑물결자나방 | – | – | – | – | – | – | 1 | – |
| | | *Eustroma aerosum* | 노랑그물물결자나방 | – | – | – | – | – | – | 1 | – |
| | | *Evecliptopera decurrens* | 흰그물물결자나방 | – | – | – | – | 1 | – | 2 | 2 |
| | | *Fascellina chromataria* | 갈고리가지나방 | 2 | 2 | – | – | – | – | 2 | 1 |
| | | *Gandaritis agnes* | 회색물결자나방 | – | 1 | – | – | – | – | – | – |
| | | *Gandaritis fixseni* | 큰노랑물결자나방 | – | – | – | 1 | – | – | – | 1 |
| | | *Gelasma grandificaria* | 큰제비푸른자나방 | – | – | – | – | – | – | – | 1 |
| | | *Geometra dieckmanni* | 흰줄푸른자나방 | – | – | – | – | 1 | – | 2 | 1 |
| | | *Geometra glaucaria* | 쌍줄푸른자나방 | – | – | – | – | – | – | 1 | – |
| | | *Gymnoscelis esakii* | 끝뾰족점물결자나방 | – | – | – | – | – | – | – | 1 |
| | | *Hemistola veneta* | 흰애기연푸른자나방 | – | – | – | – | – | – | – | 2 |
| | | *Hemithea aestivaria* | 붉은선두리푸른자나방 | – | – | – | – | – | – | – | 1 |
| | | *Heterolocha aristonaria* | 뒷분홍가지나방 | – | – | – | – | 1 | – | 5 | 1 |
| | | *Heterolocha laminaria* | 꼬마노랑가지나방 | – | 1 | 1 | 1 | – | – | – | – |
| | | *Heterostegane hyriaria* | 네무늬가지나방 | – | – | – | – | – | – | 2 | 3 |
| | | *Hypephyra terrosa* | 뒷노랑뾰족가지나방 | – | – | – | – | – | – | 2 | 1 |
| | | *Hyperapeira parva* | 애기줄가지나방 | – | – | – | – | – | – | – | 1 |
| | | *Hypomecis punctinalis* | 네눈가지나방 | – | 1 | – | – | – | – | 1 | 3 |
| | | *Hypomecis roboraria* | 세줄날개가지나방 | – | – | – | – | – | – | 3 | 1 |
| | | *Idaea auricruda* | 줄굵은애기자나방 | – | – | – | 1 | – | – | – | – |
| | | *Idaea muricata* | 분홍애기자나방 | – | – | – | – | – | – | 2 | 1 |
| | | *Idaea nielseni* | 꼬마분홍애기자나방 | – | – | – | – | – | – | 1 | – |
| | | *Idiotephria amelia* | 노랑무늬물결자나방 | – | – | – | – | – | – | – | 1 |
| | | *Jankowskia fuscaria* | 줄구름무늬가지나방 | – | 1 | – | – | – | 1 | 4 | 1 |
| | | *Jankowskia pseudathleta* | 북방구름무늬가지나방 | – | – | – | – | – | – | – | 3 |
| | | *Jodis angulata* | 애기기생푸른자나방 | – | – | – | – | – | – | – | 1 |
| | | *Jodis putata* | 기생푸른자나방 | – | – | – | – | – | – | 2 | – |
| | | *Leptostegna tenerata* | 푸른물결자나방 | – | 1 | – | – | – | – | – | – |
| | | *Lomographa subspersata* | 두줄흰가지나방 | – | – | – | 1 | | – | – | – |

**Appendix 1.** Continued

| Scientific name | | | | 2016 | | | | | | 2012[a,b,c,d,e,f] | 2005[g] |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Families | | Species | | S1 | S2 | S3 | S4 | S5 | S6 | | |
| Geometridae | 자나방과 | *Menophra senilis* | 먹그림가지나방 | 3 | 2 | 1 | 2 | 2 | 1 | 3 | 5 |
| | | *Microcalcarifera obscura* | 쌍무늬물결자나방 | – | – | – | – | – | – | – | 1 |
| | | *Microlygris complicata* | 큰애기물결자나방 | – | – | – | – | – | – | 1 | 1 |
| | | *Neohipparchus vallata* | 붉은줄푸른자나방 | – | – | – | – | – | – | – | 1 |
| | | *Ninodes splendens* | 보라애기가지나방 | – | – | – | – | – | – | – | 2 |
| | | *Nothomiza aureolaria* | 앞노랑가지나방 | – | – | – | – | – | – | 1 | – |
| | | *Obeidia tigrata* | 노랑날개무늬가지나방 | – | – | – | – | – | – | 1 | – |
| | | *Ochrognesia difficta* | 왕무늬푸른자나방 | – | – | 1 | – | – | – | 3 | – |
| | | *Odontopera arida* | 남방갈고리가지나방 | – | – | – | – | – | – | – | 1 |
| | | *Ophthalmitis albosignaria* | 큰눈노랑가지나방 | – | 1 | 1 | – | – | 1 | 3 | 5 |
| | | *Ourapteryx maculicaudaria* | 흰제비가지나방 | – | – | – | – | – | – | 1 | – |
| | | *Ourapteryx nivea* | 연노랑제비가지나방 | – | – | – | – | – | – | 2 | 2 |
| | | *Ourapteryx persica* | 굵은줄제비가지나방 | 3 | 1 | 1 | 1 | 1 | – | 1 | 3 |
| | | *Pachyligia dolosa* | 뒷흰가지나방 | – | – | – | – | – | – | – | 1 |
| | | *Parabapta clarissa* | 연푸른가지나방 | – | – | – | – | – | – | – | 2 |
| | | *Pareclipsis gracilis* | 끝짤룩노랑가지나방 | 4 | – | – | 1 | 1 | – | 2 | 1 |
| | | *Parectropis extersaria* | 흰무늬노랑가지나방 | 1 | – | – | – | – | – | – | – |
| | | *Percnia albinigrata* | 알락흰가지나방 | – | – | – | – | – | – | 1 | 1 |
| | | *Phthonosema tendinosaria* | 뿔무늬큰가지나방 | 3 | 2 | 1 | – | – | 1 | 3 | – |
| | | *Pingasa pseudoterpnaria* | 날개등근푸른자나방 | – | – | – | – | – | – | – | 1 |
| | | *Plagodis pulveraria* | 띠넓은가지나방 | – | 3 | – | 3 | – | – | 4 | 4 |
| | | *Pogonopygia nigralbata* | 섬알락흰가지나방 | – | – | – | – | – | – | – | 1 |
| | | *Polymixinia appositaria* | 담흑가지나방 | 1 | – | 2 | – | – | – | – | 3 |
| | | *Problepsis diazoma* | 네눈은빛애기자나방 | – | – | – | – | – | – | 1 | – |
| | | *Problepsis eucircota* | 큰눈흰애기자나방 | – | – | – | – | – | – | – | 1 |
| | | *Problepsis plagiata* | 점줄흰애기자나방 | 1 | – | – | – | – | – | – | 1 |
| | | *Problepsis superans* | 왕눈큰애기자나방 | – | – | – | – | – | – | 1 | – |
| | | *Protoboarmia simpliciaria* | 팽나무가지나방 | – | – | – | – | – | – | – | 1 |
| | | *Pylargosceles steganioides* | 끝무늬애기자나방 | – | – | – | – | – | – | 1 | 1 |
| | | *Racotis boarmiaria* | 남방물결가지나방 | – | – | – | – | – | – | – | 1 |
| | | *Racotis petrosa* | 참물결가지나방 | – | – | – | – | – | – | – | 2 |
| | | *Rikiosatoa grisea* | 두줄가지나방 | – | – | – | – | – | – | 1 | – |
| | | *Scopula emissaria* | 꼬마점줄흰애기자나방 | – | – | – | – | – | – | 1 | – |
| | | *Scopula floslactata* | 물결큰애기자나방 | – | – | – | – | – | – | – | 1 |
| | | *Scopula ignobilis* | 넉점물결애기자나방 | – | – | 1 | – | – | – | – | – |
| | | *Scopula nigropunctata* | 앞노랑애기자나방 | – | – | – | – | – | – | 2 | 5 |
| | | *Scopula semiignobilis* | 줄무늬애기자나방 | – | – | – | – | – | – | – | 1 |
| | | *Scopula superior* | 줄노랑흰애기자나방 | – | – | – | – | – | – | – | 1 |
| | | *Somatina indicataria* | 구름무늬흰애기자나방 | – | – | – | – | – | – | 3 | 1 |
| | | *Tanaorhinus reciprocata* | 갈고리왕푸른자나방 | – | – | – | – | – | – | 1 | 1 |
| | | *Tephrina vapulata* | 쥐빛가지나방 | – | – | – | – | – | – | – | 2 |
| | | *Thetidia albocostaria* | 네눈박이푸른자나방 | – | – | – | – | – | – | – | 3 |

**Appendix 1.** Continued

| Scientific name | | | | 2016 | | | | | | $2012^{a,b,c,d,e,f}$ | $2005^{g}$ |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Families | | Species | | S1 | S2 | S3 | S4 | S5 | S6 | | |
| Geometridae | 자나방과 | *Thinopteryx crocoptera* | 알락제비가지나방 | – | – | – | – | 1 | 1 | – | 1 |
| | | *Timandra apicirosea* | 넓은홍띠애기자나방 | – | – | – | – | – | – | – | 1 |
| | | *Timandra comptaria* | 홍띠애기자나방 | – | 1 | – | – | – | – | 4 | 1 |
| | | *Timandra dichela* | 큰홍띠애기자나방 | – | – | – | – | – | – | 2 | – |
| | | *Timandra griseata* | 붉은날개애기자나방 | – | – | – | – | – | – | – | 1 |
| | | *Xandrames dholaria* | 흰띠왕가지나방 | – | – | – | – | – | – | 1 | 1 |
| | | *Xanthorhoe hortensiaria* | 두줄물결자나방 | – | – | – | – | – | – | 1 | – |
| | | *Xanthorhoe saturata* | 물결자나방 | – | – | – | – | – | – | 1 | – |
| | | *Zanclidia testacea* | 노랑얼룩끝짤름가지나방 | – | – | – | – | – | – | – | 1 |
| Notodontidae | 재주나방과 | *Clostera anachoreta* | 꼬마버들재주나방 | – | – | – | – | – | – | – | 1 |
| | | *Clostera anastomosis* | 버들재주나방 | – | – | 2 | – | – | 1 | – | – |
| | | *Drymonia dodonides* | 점줄재주나방 | – | – | – | – | 1 | – | 1 | – |
| | | *Dudusa sphigiformis* | 꽃술재주나방 | – | – | – | – | – | – | – | 1 |
| | | *Eguria ornata* | 각시재주나방 | – | – | – | – | – | – | 1 | 1 |
| | | *Fentonia ocypete* | 밤나무재주나방 | 2 | 2 | 3 | 2 | 2 | 2 | 4 | 8 |
| | | *Gangarides dharma* | 갈고리재주나방 | – | 1 | – | – | – | – | 1 | 3 |
| | | *Harpyia umbrosa* | 은재주나방 | – | – | – | – | – | – | 1 | – |
| | | *Hexafrenum leucodera* | 끝흰재주나방 | – | – | 1 | – | – | – | – | 1 |
| | | *Lophontosia cuculus* | 높은산재주나방 | – | – | – | – | – | – | 1 | – |
| | | *Narracoides basinotata* | 점무늬재주나방 | – | – | – | – | – | – | – | 4 |
| | | *Neodrymonia coreana* | 고려재주나방 | – | – | – | – | 1 | – | – | 2 |
| | | *Neodrymonia marginalis* | 뾰족날개재주나방 | – | – | – | – | – | 1 | – | 16 |
| | | *Neostauropus basalis* | 꽃무늬재주나방 | – | – | – | – | – | 2 | 4 | 1 |
| | | *Nerice davidi* | 멋쟁이재주나방 | – | – | – | – | – | 1 | 3 | 1 |
| | | *Peridea elzet* | 노고지리재주나방 | 1 | 1 | 1 | – | 1 | 1 | 5 | 1 |
| | | *Peridea gigantea* | 곧은줄재주나방 | – | 2 | – | – | 3 | – | – | – |
| | | *Peridea lativitta* | 긴날개재주나방 | – | – | – | – | – | 1 | – | – |
| | | *Peridea oberthueri* | 오리나무재주나방 | – | – | – | – | – | – | 2 | 1 |
| | | *Phalera assimilis* | 참나무재주나방 | – | – | 2 | 2 | 2 | 4 | 6 | 4 |
| | | *Phalera flavescens* | 먹무늬재주나방 | – | – | – | – | – | – | – | 1 |
| | | *Phalera minor* | 붉은머리재주나방 | 4 | 2 | – | – | – | – | – | – |
| | | *Phalera sangana* | 배얼룩재주나방 | – | – | 1 | – | – | 1 | 3 | 1 |
| | | *Pterostoma sinicum* | 주름재주나방 | – | 1 | – | – | 2 | 1 | 2 | 1 |
| | | *Quadricalcarifera cyanea* | 때죽나무재주나방 | – | – | – | – | – | – | 1 | – |
| | | *Quadricalcarifera pryeri* | 회색재주나방 | – | – | 1 | – | – | 1 | – | 5 |
| | | *Quadricalcarifera subgeneris* | 연갈색재주나방 | – | 1 | – | – | – | – | – | 3 |
| | | *Rabtala cristata* | 곱추재주나방 | 2 | 2 | 2 | 3 | 2 | 2 | 2 | 2 |
| | | *Spatalia doerriesi* | 은무늬재주나방 | – | 2 | 2 | – | – | 3 | 3 | 1 |
| | | *Uropyia meticulodina* | 기생재주나방 | – | 1 | – | – | – | – | 1 | 1 |
| | | *Wilemanus bidentatus* | 먹무늬은재주나방 | – | – | 1 | – | – | 1 | 1 | 1 |
| Epicopeiidae | 제비나비붙이과 | *Epicopeia menciana* | 두줄제비나비붙이 | – | – | – | – | – | – | – | 1 |
| Psychidae | 주머니나방과 | *Eumeta japonica* | 남방차주머니나방 | – | – | – | – | – | – | 2 | – |
| | | *Eumeta minuscula* | 차주머니나방 | – | – | – | – | – | – | 2 | – |

**Appendix 1.** Continued

| Scientific name | | | | 2016 | | | | | | 2012$^{a,b,c,d,e,f}$ | 2005$^{g}$ |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Families | | Species | | S1 | S2 | S3 | S4 | S5 | S6 | | |
| Yponomeutidae | 집나방과 | *Yponomeuta tokyonellus* | 참빗살집나방 | – | – | – | – | – | – | – | 42 |
| | | *Ypsolopha blandellus* | 갈고리좀나방 | – | – | – | – | – | – | – | 2 |
| | | *Ypsolopha strigosus* | 흰줄좀나방 | – | – | – | – | – | – | 1 | – |
| Thyrididae | 창나방과 | *Rhodoneura erecta* | 꼬마상수리창나방 | – | – | – | – | 1 | – | 1 | 1 |
| | | *Rhodoneura shini* | 줄무늬창나방 | 2 | 1 | – | – | – | – | – | – |
| | | *Rhodoneura vittula* | 상수리창나방 | – | 1 | – | – | – | – | 1 | 1 |
| | | *Striglina cancellata* | 창나방 | 1 | 1 | – | – | – | – | 3 | 3 |
| | | *Striglina venia* | 주엽나무창나방 | – | – | – | – | – | – | – | 4 |
| Crambidae | 포충나방과 | *Agrotera nemoralis* | 연보라들명나방 | – | – | – | – | – | – | 6 | 1 |
| | | *Analthes maculalis* | 제비날개들명나방 | – | – | – | 1 | – | – | 1 | – |
| | | *Analthes semitritalis* | 홀씨무늬들명나방 | – | – | – | – | – | – | 1 | – |
| | | *Anania verbascalis* | 각시뾰족들명나방 | – | – | – | – | – | – | – | 1 |
| | | *Ancylolomia japonica* | 벼포충나방 | – | 2 | 1 | – | – | 1 | 6 | 1 |
| | | *Botyodes aptalis* | 얼룩들명나방 | – | – | – | – | – | – | 1 | 1 |
| | | *Botyodes diniasalis* | 포플라잎말이명나방 | – | – | – | – | – | – | 1 | 1 |
| | | *Botyodes principalis* | 큰점노랑들명나방 | – | – | – | – | – | – | 1 | – |
| | | *Bradina atopalis* | 흰점줄들명나방 | 1 | – | 1 | – | – | – | – | – |
| | | *Bradina geminalis* | 외줄들명나방 | 11 | 7 | 8 | 6 | 6 | 6 | 5 | 1 |
| | | *Calamotropha okanoi* | 점흰포충나방 | – | – | – | – | – | – | – | 1 |
| | | *Calamotropha paludella* | 흰포충나방 | – | – | – | – | – | – | 2 | – |
| | | *Chabula onychinalis* | 점알락들명나방 | – | – | 1 | – | – | – | – | – |
| | | *Chabula telphusalis* | 큰흰무늬들명나방 | – | – | – | – | – | – | – | 1 |
| | | *Chilo suppressalis* | 이화명나방 | – | – | – | – | – | – | – | 1 |
| | | *Cirrhochrista brizoalis* | 은빛들명나방 | – | – | 1 | – | – | – | – | – |
| | | *Cnaphalocrocis stereogona* | 날개검은들명나방 | – | – | – | – | – | – | – | 1 |
| | | *Conogethes punctiferalis* | 복숭아명나방 | – | 2 | 1 | – | – | – | 2 | 5 |
| | | *Cotachena alysoni* | 울릉노랑들명나방 | – | – | – | – | – | – | 1 | 6 |
| | | *Cotachena pubescens* | 흰무늬노랑들명나방 | – | – | – | – | – | – | 1 | – |
| | | *Diasemia accalis* | 점애기들명나방 | – | – | – | – | – | – | 4 | – |
| | | *Elophila* (*Cyrtogramme*) *turbata* | 얼룩애기물명나방 | – | – | – | – | – | – | 1 | 1 |
| | | *Elophila* (*Elophila*) *interruptalis* | 연물명나방 | – | – | – | – | – | – | 2 | 1 |
| | | *Eurrhyparodes accessalis* | 애기무늬들명나방 | – | – | 1 | – | 1 | 1 | 5 | – |
| | | *Eurrhyparodes contortalis* | 말굽무늬들명나방 | 4 | – | – | – | – | – | – | – |
| | | *Glyphodes perspectalis* | 회양목명나방 | 2 | – | – | – | – | – | 3 | 1 |
| | | *Glyphodes pryeri* | 닥나무들명나방 | – | – | – | – | – | – | 1 | – |
| | | *Glyphodes quadrimaculalis* | 큰각시들명나방 | – | – | – | – | – | – | 3 | 1 |
| | | *Goniorhynchus butyrosa* | 남방노랑들명나방 | – | – | – | – | 1 | – | 1 | – |
| | | *Goniorhynchus exemplaris* | 노랑무늬들명나방 | – | – | – | – | – | – | 3 | 11 |
| | | *Haritalodes derogata* | 목화명나방 | 2 | – | – | – | – | – | – | 1 |
| | | *Herpetogramma fuscescens* | 줄점들명나방 | – | 1 | – | – | – | – | 1 | – |
| | | *Herpetogramma luctuosalis* | 포도들명나방 | 5 | 3 | 2 | – | – | 3 | 6 | 11 |

**Appendix 1.** Continued

| Scientific name | | | | 2016 | | | | | | 2012$^{a,b,c,d,e,f}$ | 2005$^{g}$ |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Families | | Species | | S1 | S2 | S3 | S4 | S5 | S6 | | |
| Crambidae | 포충나방과 | *Herpetogramma rudis* | 앞노랑무늬들명나방 | – | – | – | – | – | – | – | 1 |
| | | *Metaeuchrominus flavofascialis* | 칠점박이벼명나방 | – | – | – | – | – | – | 1 | – |
| | | *Miyakea expansa* | 큰칠점박이포충나방 | – | – | – | – | 1 | – | 1 | – |
| | | *Mutuuraia terrealis* | 높은산들명나방 | – | – | – | – | – | – | 1 | – |
| | | *Nacoleia commixta* | 얼룩애기들명나방 | – | 1 | 1 | 2 | – | – | – | – |
| | | *Nacoleia sibiriialis* | 가루뿌린들명나방 | – | – | 1 | – | – | – | 1 | – |
| | | *Nomophila noctuella* | 등심무늬들명나방 | – | – | – | – | – | – | 1 | – |
| | | *Nymphicula saigusai* | 뒷무늬노랑물명나방 | – | – | – | – | – | – | 1 | – |
| | | *Omiodes noctescens* | 노랑다리들명나방 | – | 1 | – | – | – | – | – | 4 |
| | | *Omiodes tristrialis* | 흰다리들명나방 | – | – | – | – | – | – | – | 1 |
| | | *Ostrinia furnacalis* | 조명나방 | – | – | – | – | – | – | 1 | 7 |
| | | *Ostrinia orientalis* | 오리엔트조명나방 | – | – | – | – | – | – | – | 1 |
| | | *Ostrinia palustralis memnialis* | 분홍무늬들명나방 | – | – | – | – | – | – | 1 | 1 |
| | | *Ostrinia scapulalis* | 콩줄기명나방 | – | – | – | – | – | – | 1 | 1 |
| | | *Ostrinia zaguliaevi* | 큰섬들명나방 | – | – | 1 | – | – | – | 1 | – |
| | | *Paliga auratalis* | 금빛세줄들명나방 | – | – | – | – | – | – | – | 1 |
| | | *Palpita inusitata* | 애기흰들명나방 | – | – | 3 | – | 3 | – | 4 | 4 |
| | | *Palpita nigropunctalis* | 수수꽃다리명나방 | 3 | – | 3 | – | 2 | – | 4 | 2 |
| | | *Parapotnx vittalis* | 애벼물명나방 | – | – | – | – | – | – | 1 | – |
| | | *Patissa fulvosparsa* | 알락긴날개명나방 | – | – | – | – | – | – | – | 3 |
| | | *Piletocera sodalis* | 콩팥무늬들명나방 | 2 | 3 | – | – | – | 3 | – | – |
| | | *Pleuroptya balteaya* | 갈참나무명나방 | – | – | – | – | – | – | – | 1 |
| | | *Pleuroptya chlorophanta* | 몸노랑들명나방 | 6 | 3 | 3 | 3 | 3 | 2 | 4 | 1 |
| | | *Pleuroptya harutai* | 장미색들명나방 | – | – | – | – | – | – | 1 | – |
| | | *Pleuroptya punctimarginalis* | 가두리들명나방 | – | – | – | – | – | – | 1 | – |
| | | *Pleuroptya quadrimaculalis* | 네눈들명나방 | – | 2 | 3 | 2 | 2 | 2 | 2 | – |
| | | *Polythlipta liquidalis* | 선비들명나방 | – | – | – | – | – | – | 2 | 1 |
| | | *Pseudargyria interruptella* | 줄은빛포충나방 | – | – | – | – | – | – | – | 1 |
| | | *Pseudocatharylla simplex* | 은빛포충나방 | – | – | – | – | – | – | – | 1 |
| | | *Pycnarmon cribrata* | 크리버들명나방 | – | – | – | – | – | – | 1 | – |
| | | *Pycnarmon pantherata* | 끝무늬들명나방 | – | – | – | – | – | – | 2 | 1 |
| | | *Pycnarmon tylostegalis* | 구름무늬들명나방 | 1 | – | – | – | – | 1 | – | – |
| | | *Pygospila tyres* | 큰알락들명나방 | – | – | – | – | – | – | – | 1 |
| | | *Pyrausta mutuurai* | 진도들명나방 | – | – | – | – | – | – | – | 1 |
| | | *Pyrausta unipunctata* | 앞무늬들명나방 | – | – | – | – | – | – | 5 | 1 |
| | | *Rehimena phrynealis* | 앞노랑검은들명나방 | – | 1 | – | – | – | – | 2 | – |
| | | *Rehimena surusalis* | 점노랑들명나방 | – | – | – | – | – | – | – | 1 |
| | | *Scirpophaga virginia* | 은빛긴날개명나방 | – | – | – | – | – | – | – | 1 |
| | | *Sinomphisa plagialis* | 개오동명나방 | 1 | – | – | – | – | – | – | – |
| | | *Sitochroa recurvalis* | 흰띠명나방 | – | – | – | – | – | – | 6 | 1 |

**Appendix 1.** Continued

| Scientific name | | | | 2016 | | | | | | 2012[a,b,c,d,e,f] | 2005[g] |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Families | | Species | | S1 | S2 | S3 | S4 | S5 | S6 | | |
| Crambidae | 포충나방과 | *Syllepte invalidalis* | 큰연무늬들명나방 | – | – | – | – | – | – | – | 2 |
| | | *Syllepte pallidinotalis* | 연무늬들명나방 | – | – | – | – | – | – | 2 | – |
| | | *Syllepte segnalis* | 달무늬들명나방 | – | – | – | – | – | – | 1 | 1 |
| | | *Syllepte taiwanalis* | 대만들명나방 | – | – | – | – | – | – | 2 | – |
| | | *Tyspanodes hypsalis* | 줄검은들명나방 | 3 | 3 | 3 | 4 | – | 3 | 2 | 3 |
| | | *Tyspanodes striata* | 꽃날개들명나방 | 3 | 3 | – | – | – | – | – | – |
| Nolidae | 혹나방과 | *Mimerastria mandschuriana* | 사과혹나방 | – | – | – | – | – | – | – | 1 |

S1, Geubchisan; S2, Jiryeoksan; S3, Cheondungsan; S4, Cheomchalsan-1; S5, Cheomchalsan-2; S6, Godusan.

[a] National Institute of Environmental Research, 2012a. The 3rd National Ecosystem Survey-Gasa (346091) [CD-Rom] (in Korean).

[b] National Institute of Environmental Research, 2012b. The 3rd National Ecosystem Survey-Jinjo (346101) [CD-Rom] (in Korean).

[c] National Institute of Environmental Research, 2012c. The 3rd National Ecosystem Survey-Jisan (346092) [CD-Rom] (in Korean).

[d] National Institute of Environmental Research, 2012d. The 3rd National Ecosystem Survey-Munnae (346063) [CD-Rom] (in Korean).

[e] National Institute of Environmental Research, 2012e. The 3rd National Ecosystem Survey-Seuldo (346094) [CD-Rom] (in Korean).

[f] National Institute of Environmental Research, 2012f. The 3rd National Ecosystem Survey-Yulli (346054) [CD-Rom] (in Korean).

[g] Sohn et al., 2005. A faunistic study of Lepidoptera (Insecta) in Is. Jin-do, Korea. The Korean Journal of Systematic Zoology, Special Issue No. 5:81–104.